SLV-ED10ME/ED10MPS/ED10PS/ED10SG/ED40ME/ED40PS/ED40SG/ED60ME/ ED60PS/ED60SG/ED70MN/EZ10AZ/EZ40AZ/EZ60AZ/EZ70AS/EZ70NZ

RMT-V245/V245A/V245C/V247/V247C/V247D/V248C

SERVICE MANUAL

Australian Model

SLV-EZ10AZ/EZ40AZ/EZ60AZ/EZ70AS

E Model

SLV-ED10MPS/ED10PS/ED40PS/ED60PS/ED70MN

ME Model

SLV-ED10ME/ED10SG/ED40ME/
ED40SG/ED60ME/ED60SG

Newzealand Model

SLV-EZ10AZ/EZ40AZ/EZ60AZ/EZ70NZ

Photo: SLV-ED70MN

S MECHANISM

Hi-Fi

G-CODE

- **Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)**

* The abbreviations of ED10, ED40, ED60, ED70, EZ10, EZ40, EZ60 and EZ70 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

Abbreviated model name	ED10	ED40	ED60	ED70	EZ10	EZ40	EZ60	EZ70
All model names SLV-	ED10ME ED10MPS ED10PS ED10SG	ED40ME ED40PS ED40SG	ED60ME ED60PS ED60SG	ED70MN	EZ10AZ	EZ40AZ	ED60AZ	EZ70AS EZ70NZ

VHS PAL NTSC

VIDEO CASSETTE RECORDER

MICROFILM

SONY®

SPECIFICATIONS

System

- Color system
  - ED10/ED40/ED60/ED70:
    - PAL, MESECAM, NTSC 3.58, NTSC 4.43
  - EZ10/EZ40/EZ60/EZ70:
    - PAL, NTSC 4.43
- TV system
  - ED10/ED40/ED60/ED70:
    - B/G, D/K, I
  - EZ10/EZ40/EZ60/EZ70:
    - B/G
- Channel coverage
  - ED10/ED40/ED60/ED70:
    - B/G: VHF E2 to E12/UHF E21 to E69/ CATV S01 to S05, S1 to S41
    - D/K: VHF R1 to R12, UHF R21 to R69
    - I: VHF SA4 to SA13/UHF B21 to B69/ CATV S01 to S05, S1 to S41
  - EZ10/EZ40/EZ60 (COUNTRY is set to AUS), EZ70AS:
    - VHF AS0 to AS12, AS5A, AS9A
    - UHF AS28 to AS69
    - CATV S01 to S05, S1 to S41
  - EZ10/EZ40/EZ60 (COUNTRY is set to NZ), EZ70NZ:
    - VHF NZ1 to NZ11
    - UHF E21 to E69
    - CATV S01 to S05, S1 to S41
- RF output signal
  - ED10/ED40/ED60/ED70/EZ70NZ:
  - UHF channels 21 to 69
  - EZ10/EZ40/EZ60/EZ70AS:
  - UHF channels 28 to 69
- Aerial out
  - 75-ohm asymmetrical aerial socket

Inputs and outputs

- LINE IN (ED10/EZ10/EZ40/EZ60)
- LINE-1 IN (ED40/ED60/ED70/EZ70)
  - VIDEO IN, phono jack (1)
  - Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
  - AUDIO IN (MONO), phono jack (1) (ED10/ED40/EZ10/EZ40)
  - AUDIO IN, phono jack (2) (ED60/ED70/ EZ60/EZ70)
  - Input level: 327 mVrms
  - Input impedance: more than 47 kilohms
- LINE-2 IN (ED40/ED60/ED70/EZ70)
  - VIDEO IN, phono jack (1)
  - Input signal: 1Vp-p, 75 ohms, unbalanced, sync negative
  - AUDIO IN (MONO), phono jack (2) (ED40)
  - AUDIO IN, phono jack (2) (ED60/ED70/ EZ70)
  - Input level: 327mVrms
  - Input impedane: more than 47 kilohms
- LINE-3 IN (SAT IN) (ED40/ED60/ED70/ EZ70AS)
  - VIDEO IN, phono jack (1)
  - Input signal: 1Vp-p, 75 ohms, unbalanced, sync negative
  - AUDIO IN (MONO), phono jack (2) (ED40)
  - AUDIO IN, phono jack (2) (ED60/ED70/ EZ70AS)
  - Input level: 327mVrms
  - Input impedane: more than 47 kilohms
- LINE OUT (ED10/ED40/EZ10/EZ40)
- LINE-1 OUT (ED60/ED70/EZ60/EZ70)
  - VIDEO OUT, phono jack (1)
  - Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
  - AUDIO OUT, phono jack (1) (ED10/EZ10/ EZ40)
  - AUDIO OUT (MONO), phono jack (2) (ED40)
  - AUDIO OUT, phono jack (2) (ED60/ED70/ EZ60/EZ70)
  - Standard output: 327 mVrms
  - Load impedance; 47 kilohms
  - Output impedance: less than 10 kilohms
- LINE-2 OUT (AUDIO) (ED60/ED70/EZ60/EZ70)
  - AUDIO OUT, phono jack (2)
  - Standard output: 327 mVrms
  - Load impedance; 47 kilohms
  - Output impedance: less than 10 kilohms
- SKY TV DECODER (EZ70NZ)
  - VIDEO IN, phono jack (1)
  - Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
  - VIDEO OUT, phono jack (1)
  - Output signal: 1 Vp-p, 75 ohms, unbalanced.

General

- Power requirements
  - 110 – 240 V AC, 50/60 Hz (ED10/ED40/ ED60/ED70)
  - 220-240 V AC, 50 Hz (EZ10/EZ40/EZ60/ EZ70)
- Power consumption
  - 18W (ED10/ED40/ED60/EZ10/EZ40)
  - 20W (ED70/EZ60/EZ70)
- Operating temperature
  - 5 ˚C to 40 ˚C
- Storage temperature
  - –20 ˚C to 60 ˚C
- Dimensions
  - Approx. 355 × 96 × 289 mm (w/h/d): (ED10/EZ10)
  - Approx. 430 × 100 × 295 mm (w/h/d): (ED40/ED60/ED70/EZ40/EZ60/EZ70) including projecting parts and controls
- Mass
  - Approx. 3.6 kg: (ED10/EZ10)
  - Approx. 4.2 kg: (ED40)
  - Approx. 4.5 kg: (ED60/ED70/EZ40/EZ60/ EZ70)

Supplied accessories

- Remote commander (1)
- R6 (size AA) batteries (2)
- Aerial cable (1)
- Plug adaptor (1) (ED10ME/ED10SG/ED40ME/ ED40SG/ED60ME/ED60SG)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

- **Feature Difference**

SLV- **FEATURE**	**ED10**	**ED40**	**ED60**	**ED70**	**EZ10**	**EZ40**	**EZ60**	**EZ70 AS**	**EZ70 NZ**
HEAD/CH	2/2	4/4	4/6	4/6	2/2	4/4	4/6	4/6	4/6
NTSC (3.58) (REC/PB)	○	○	○	○	×	×	×	○	○
(4.43) (REC/PB)	○	○	○	○	×/○	×/○	×/○	○	○
ME-SECAM (REC/PB)	○	○	○	○	×	×	×	×	×
REC (NTSC) (SP/EP)	○	○	○	○	×	×	×	○	○
(PAL) (SP/LP)	○	○	○	○	○	○	○	○	○
PLAY (NTSC) (SP/LP/EP)	○	○	○	○	○	○	○	○	○
(PAL) (SP/LP)	○	○	○	○	○	○	○	○	○
RCA REAR LINE INPUT	○	○	○ (3pin Y.W.R)	○ (3pin Y.W.R)	○	○	○ (3pin Y.W.R)	○ (3pin Y.W.R)	○ (3pin Y.W.R)
RCA REAR LINE OUTPUT	○	○ (3pin Y.B.B)	○ (3pin Y.W.R)	○ (3pin Y.W.R)	○	○	○ (3pin Y.W.R)	○ (3pin Y.W.R)	○ (3pin Y.W.R)
ADDITIONAL REAR INPUT (SAT IN)	×	○ (3pin Y.B.B)	○ (3pin Y.W.R)	○ (3pin Y.W.R)	×	×	×	○ (3pin Y.W.R)	×
ADDITIONAL REAR OUTPUT (AUDIO OUT)	×	×	○	○	×	×	○	○	○
SKYDECODER REAR IN/OUT	×	×	×	×	×	×	×	×	○
RCA FRONT LINE INPUT	×	○ (3pin Y.B.B)	○ (3pin Y.W.R)	○ (3pin Y.W.R)	×	×	×	○ (3pin Y.W.R)	○ (3pin Y.W.R)
MODULATOR SYSTEM	G/K/I	G/K/I	G/K/I	G/K/I	G	G	G	G	G
CLICK SHUTTLE	×	×	×	○	×	×	×	○	○
REMOTE COMMANDER RMT-	V248C	V247	V247C	V247D	V245A	V245A	V245C	V245	V245

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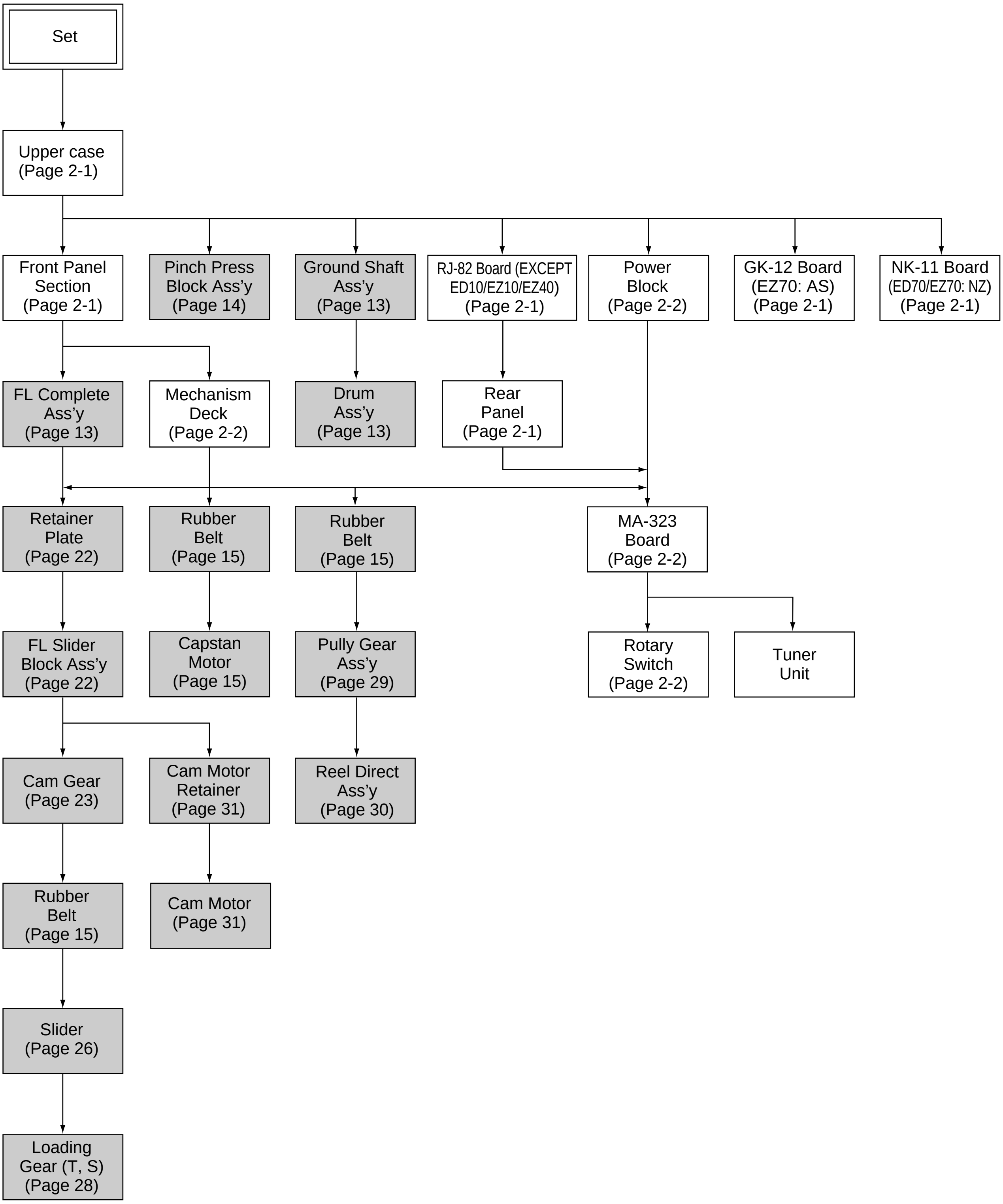
SERVICE NOTE

1. DISASSEMBLY

- This set can be disassembled in the order shown below.

Note: Pages in ☐ indicated pages in the SERVICE MANUAL.
Pages in ▨ indicated pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.


Set
Upper case (Page 2-1)
Front Panel Section (Page 2-1)
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SECTION 1
GENERAL

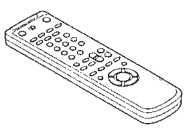
This section is extracted from SLV-ED70MN instruction manual. (3-865-382-11)

Step 1

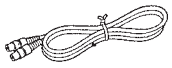
Unpacking

Check that you have received the following items with the VCR:

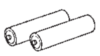
- Remote commander



- Aerial cable



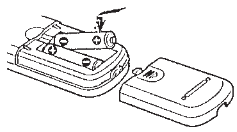
- R6 (size AA) batteries



Step 2

Setting up the remote commander

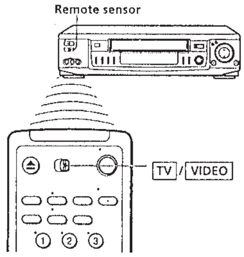
Inserting the batteries



Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.

Using the remote commander



You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the ▣ symbol near the remote sensor, this remote commander will not operate the TV.

To operate	Set TV/VIDEO to
the VCR	VIDEO and point at the remote sensor on the VCR
a Sony TV	TV and point at the remote sensor on the TV

Notes

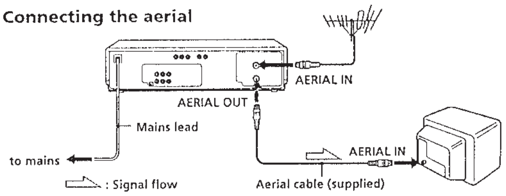
- The TV/VIDEO button selects an input source of the TV from either aerial in or line in. The button does not control this VCR.
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Step 3

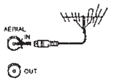
Connecting the VCR

Connect the aerial to your VCR and TV as shown below to watch TV programmes and VCR pictures on your TV. In addition, if your TV has audio/video (A/V) input jacks, we recommend you connect the VCR to your TV using an audio/video cable to get a better picture and sound.

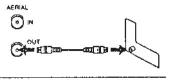
Connecting the aerial



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.



2 Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.



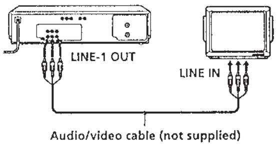
3 Connect the mains lead to the mains.

Additional connections

To a TV that has audio/video input jacks

This additional connection improves picture and sound quality. Connect the TV as shown on the right.

If you want to use the Trinitron TV Synchro Play function (see page 22), this connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)



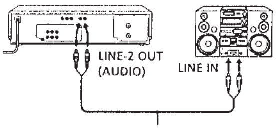
Audio/video cable (not supplied)

To a stereo system

You can improve sound quality by connecting a stereo system as shown on the right.

Note

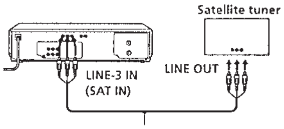
- To listen to playback sounds in stereo, you must use either of the connections above.



Audio cable (not supplied)

To a satellite tuner

You can record programmes from other equipment such as a satellite tuner.

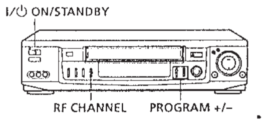


Audio/video cable (not supplied)

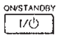
Step 4

Tuning your TV to the VCR

If you have connected your VCR to the TV using the audio/video cable, skip this step.



1



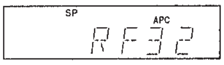
Press I/⏻ ON/STANDBY to turn on the VCR.

2

Press RF CHANNEL on the VCR.

The factory-preset RF channel appears in the display window.

The VCR signal is output through this channel to the TV.



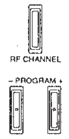
3

Turn on your TV and select a programme position for the VCR picture.

This channel will now be referred to as the video channel.

Some TV has the programme position, such as 0, that is reserved for a VCR. In this case, select that programme position for the VCR picture. Refer to the instruction manual of your TV for details.

4

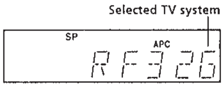


Press RF CHANNEL.

The TV system indicator appears in the display window.

Press PROGRAM +/– to select the correct TV system.

If your TV system is	Select
B/G	G
I	I
D/K	K

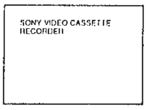


5

Tune the TV to the same channel as that shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.



6

Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

To obtain a clear picture from the VCR

If the picture does not appear clearly in step 5 above, go to step 6 to finish this procedure once. Then start from step 2. After pressing RF CHANNEL in step 2 to display the RF channel, press PROGRAM +/– so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

If you cannot obtain a clear picture after performing this procedure, we recommend you connect the VCR and TV using the audio/video cable (see "To a TV that has audio/video input jacks" on page 6). If the same symptom persists, consult your nearest Sony dealer.

Note

- If you set the wrong TV system, you may have no sound or sound may be distorted (noisy sound).

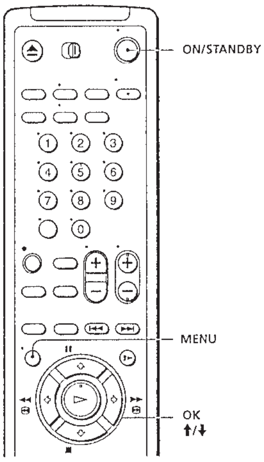
Step 5

Selecting a language

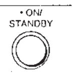
You can change the on-screen display language from English to Arabic.

Before you start...

- Turn on your TV and set it to the video channel.

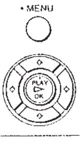


1

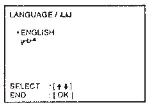


Press ON/STANDBY to turn on the VCR.

2



Press MENU, then press ↑/↓ to move the cursor (▶) to LANGUAGE and press OK.

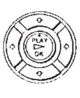


LANGUAGE / لغة

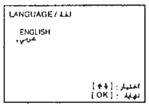
•ENGLISH
عربي

SELECT : [↑↓]
END : [OK]

3



Press ↑/↓ to select the desired language, then press OK.



LANGUAGE / لغة

ENGLISH
•عربي

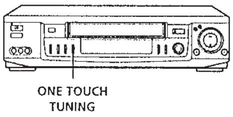
[↑↓] : اختيار
[OK] : نهاية

Step 6

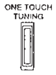
Presetting channels

First, we recommend that you preset the receivable channels in your area using the one touch tuning or the AUTO PRESET in the TUNER PRESET menu. Then, if some channels could not be preset automatically, set them manually; if there are any unwanted channels among the preset ones, you can disable the channels.

Presetting all receivable channels using one touch tuning

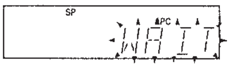


1



Press ONE TOUCH TUNING on the VCR for more than 3 seconds.

The VCR starts the channel presetting.



The WAIT indicator goes off when all receivable channels are preset.

To check if the channels are preset correctly

Set the TV to the video channel and press PROGRAM +/– on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/–, the channels are preset correctly.

If the sound is distorted or noisy, the VCR is set to a TV system different from your area's. Select the TV system and preset channels using the TUNER PRESET menu on the next page.

Tip

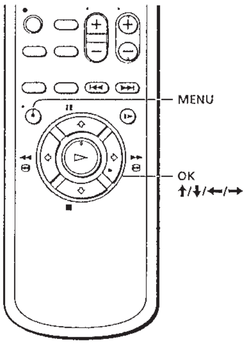
- To stop one touch tuning, press ONE TOUCH TUNING or ■ STOP on the VCR during the setting.

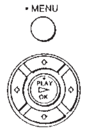
continued

Presetting all receivable channels automatically

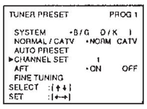
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



1 

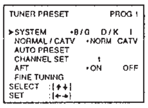
Press MENU, then press ↑/↓ to move the cursor (▶) to TUNER PRESET and press OK.



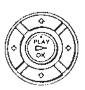
```
TUNER PRESET           PROG 1

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
▶CHANNEL SET       1
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

2

Press ↑/↓/←/→ to move the cursor (▶) to SYSTEM, then select B/G, D/K or I, whichever is applicable in your area. If SYSTEM is set to the wrong position, the sound will be distorted or noisy.

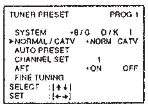


```
TUNER PRESET           PROG 1

▶SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
 CHANNEL SET       1
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

3 

Press ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

To preset CATV channels, select CATV.

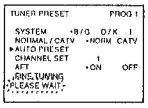


```
TUNER PRESET           PROG 1

 SYSTEM      •B/G  D/K  I
▶NORMAL / CATV   •NORM CATV
 AUTO PRESET
 CHANNEL SET       1
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

4

Press ↑/↓ to move the cursor (▶) to AUTO PRESET, then press OK.

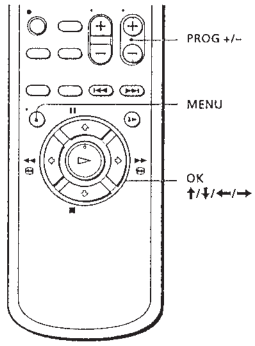
All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

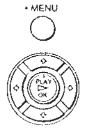


```
TUNER PRESET           PROG 1

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
▶AUTO PRESET
 CHANNEL SET       1
 AFT             •ON    OFF
 FINE TUNING
PLEASE WAIT
```

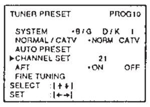
continued

Presetting channels manually



1 

Press MENU, then press ↑/↓ to move the cursor (▶) to TUNER PRESET and press OK.

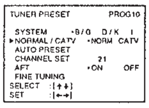


```
TUNER PRESET          PROG10

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
▶CHANNEL SET      21
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

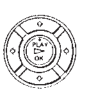
2

Press ↑/↓/←/→ to move the cursor (▶) to NORMAL/CATV, then select NORM.

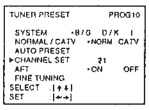
To preset CATV channels, select CATV.



```
TUNER PRESET          PROG10

 SYSTEM      •B/G  D/K  I
▶NORMAL / CATV   •NORM CATV
 AUTO PRESET
 CHANNEL SET      21
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

3 

Press ↑/↓ to move the cursor (▶) to CHANNEL SET.

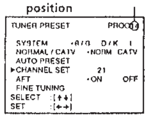


```
TUNER PRESET          PROG10

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
▶CHANNEL SET      21
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

4

Press PROG +/– to select the programme position.

Selected programme position

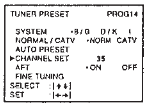


```
TUNER PRESET          PROG14

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
▶CHANNEL SET      21
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

5

Press → repeatedly until the channel you want is displayed.
Pressing ← goes back to the previous channels.

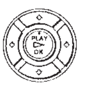
The channels are scanned in the following order:



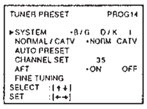
```
TUNER PRESET          PROG14

 SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
▶CHANNEL SET      35
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

Channel coverage	System B/G	System D/K	System I
VHF	E2–E12	R1–R12	SA4–SA13
UHF	E21–E69	R21–R69	B21–B69
CATV (TV distribution)	S1–S41, S01–S05	–	S1–S41, S01–S05

If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5."

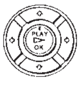
6 

If the TV sound is distorted or noisy, press ↑/↓/←/→ to move the cursor (▶) to SYSTEM, then select B/G, D/K or I whichever is applicable in your area.



```
TUNER PRESET          PROG14

▶SYSTEM      •B/G  D/K  I
 NORMAL / CATV   •NORM CATV
 AUTO PRESET
 CHANNEL SET      35
 AFT             •ON    OFF
 FINE TUNING
SELECT    :[↑↓]
SET       :[←→]
```

7 To allocate another channel to another programme position, repeat steps 4 and 5.

8 

Press OK.

continued

Disabling unwanted programme positions

After tuning the TV channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/– buttons.

1 In step 5 on page 15, press programme number button "0" twice to display the number "0" beside CHANNEL SET.

2 Press OK.

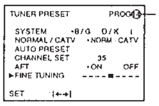
If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

1 Press PROG +/– to select the programme number for which you cannot obtain a clear picture.

2 Press MENU, then select TUNER PRESET and press OK.

3 Select FINE TUNING. The fine tuning meter appears.


TUNER PRESET PROG 3
SYSTEM •B/G D/K I
NORMAL / CATV •NORM CATV
AUTO PRESET
CHANNEL SET 35
AFT •ON OFF
▶FINE TUNING ----■----
SET :[←→]

4 Press ←/→ to get a clearer picture, then press OK.

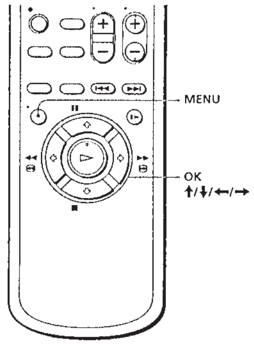
Note that the AFT (Auto Fine Tuning) setting switches to OFF.

Note

- The menu disappears automatically if you do not proceed for more than a few minutes.

Step 7

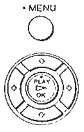
Setting the clock



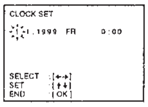
You must set the time and date on the VCR to be able to use the timer recording features properly.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

1 

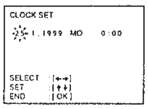
Press MENU, then press ↑/↓ to move the cursor (▶) to CLOCK SET and press OK.


CLOCK SET
1.1.1999 FR 0:00
SELECT :[←→]
SET :[↑↓]
END :[OK]

2

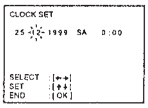
Press ↑/↓ to set the date.

The day of the week is set automatically.

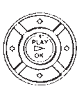

CLOCK SET
25.1.1999 MO 0:00
SELECT :[←→]
SET :[↑↓]
END :[OK]

3

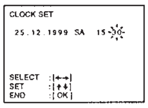
Press → to flash the month and set the month using ↑/↓.

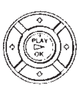

CLOCK SET
25.12.1999 SA 0:00
SELECT :[←→]
SET :[↑↓]
END :[OK]

continued

4 

Set the year, hour and minutes in sequence, using → to flash the item to be set, and ↑/↓ to select the digits.


CLOCK SET
25.12.1999 SA 15:30
SELECT :[←→]
SET :[↑↓]
END :[OK]

5 

Press OK to start the clock.

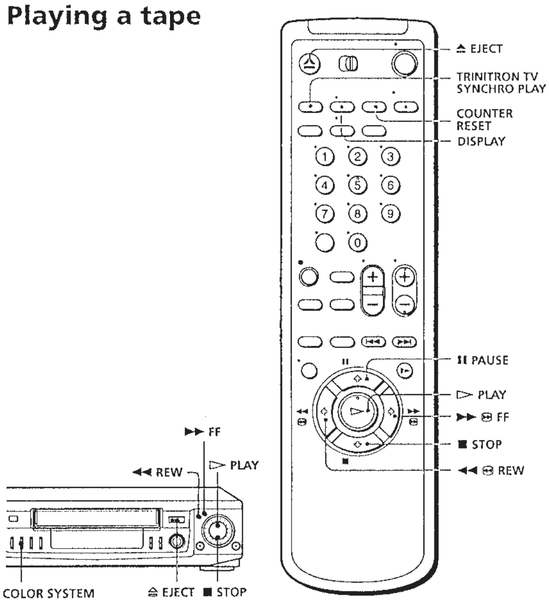
Tip

- To change the digits during setting, press ← to return to the item to be changed, and select the digits using ↑/↓.

Note

- The menu disappears automatically if you do not proceed for more than a few minutes.

Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

continued

Playing a tape (continued)

3
Press ⊳ PLAY.
When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	❚❚ PAUSE
Resume play after pause	❚❚ PAUSE or ⊳ PLAY
Fast-forward the tape	►► ⊕ FF (►► FF on the VCR) during stop
Rewind the tape	◄◄ ⊖ REW (◄◄ REW on the VCR) during stop
Eject the tape	≜ EJECT

To set the colour system

If streaks appear during playback, press COLOR SYSTEM on the VCR to conform to the system that the tape was recorded in. (Normally, the colour system is correctly set whenever the tape is inserted.)

If your tape was recorded in	Press COLOR SYSTEM until the indication below appears in the display window.
PAL	PAL
MESECAM	PAL
NTSC	NTSC

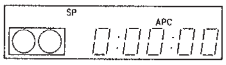
To play an NTSC-recorded tape

Set NTSC PB at the rear of the VCR according to the colour system of your TV.

If your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC 4.43	NTSC 4.43
NTSC 3.58	NTSC 3.58

To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.



To display the counter on the TV screen, press DISPLAY.

Notes
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two colour systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the colour density increases or decreases.
- Tapes recorded in the LP mode of NTSC system on other VCRs can be played back on this VCR, but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use the ⊳ PLAY, ❚❚ PAUSE, ►► ⊕ FF, ◄◄ ⊖ REW or ■ STOP button. These buttons are used for menu operations.

continued

Playing a tape (continued)

Turning on the VCR and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the VCR and TV with the audio/video cable (see "To a TV that has audio/video input jacks" on page 6). Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the VCR.

Operation

Make sure that the TV's main power is on.

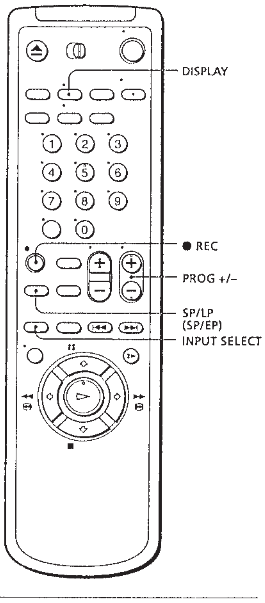
Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

The VCR and TV turn on, and the TV is set to VCR reception. If there is a tape in the VCR, playback starts automatically.

Notes
- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY while playing back a video tape. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Recording TV programmes

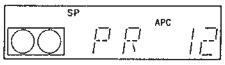


1 Turn on your TV and set it to the video channel.

2 Insert a tape with its safety tab in place.

3

Press PROG +/– to select the programme position you want to record.

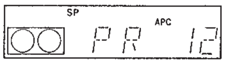


continued

4

Press SP/LP (SP/EP) to select the tape speed, SP or LP.

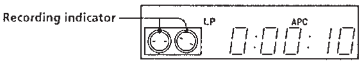
LP (Long Play) provides recording time twice as long as SP (Standard Play), however, SP produces better picture and audio quality.



5

Press ● REC to start recording.

The recording indicator lights up red in the display window.

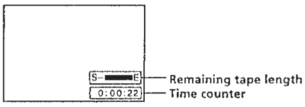


To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.



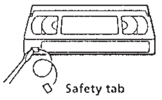
To watch another TV programme while recording

1 If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.

2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.



To record NTSC colour system programmes

NTSC colour signals can be recorded on this VCR from the LINE-1 IN, LINE-2 IN and LINE-3 IN (SAT IN) jacks only.

To select the line input, press INPUT SELECT or PROG +/– so that "L1", "L2" or "L3" appears in the display window.

For tape speed, select SP or EP in step 4.

EP provides recording time three times as long as SP, however, SP produces better picture and sound quality.

When playing back, the VCR automatically detects the tape speed.

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -/-- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN, LINE-2 IN or LINE-3 IN (SAT IN) jacks. Press INPUT SELECT or PROG +/– to display "L1", "L2" or "L3" in the display window.
- The display appears on the TV screen indicating information about the tape, but the information will not be recorded on the tape.
- If you do not want to watch TV while recording, you can turn off the TV.

Notes

- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.
- The remaining tape length does not appear while playing or recording in NTSC system.

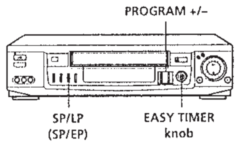
Recording TV programmes using the easy timer

You can record one programme on the same day (within 24 hours) with the easy timer. If the VCR clock has not been set, you can set the clock before setting the timer recording.

Setting the easy timer

Before you start...

- Insert a tape with its safety tab in place. Make sure the tape is longer than the recording time.
- If you want to see the setting on the TV screen, turn on the TV and set it to the video channel.

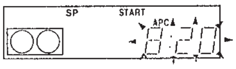


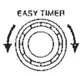
1

Press the EASY TIMER knob.

The START indicator appears in the display window.

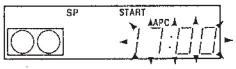
If the clock has not been set, "-:- -" appears. Go to step 2 in "Setting or changing the easy clock" on page 28.



2 

Set the recording start time by turning the EASY TIMER knob clockwise or counterclockwise to increase or decrease the time by 15 minutes.

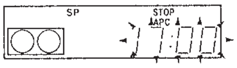
To increase or decrease the time by one minute, press PROGRAM +/–.



3

Press the EASY TIMER knob to confirm the start time setting.

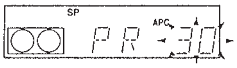
The STOP indicator appears.

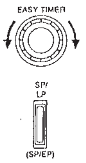


4

Set the recording stop time in the same way as in step 2, then press the EASY TIMER knob.

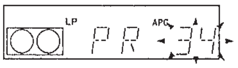
A programme number flashes.



5 

Turn the EASY TIMER knob clockwise or counterclockwise to select the programme you want to record.

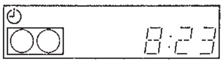
To select the tape speed, press SP/LP (SP/EP).



6

Press the EASY TIMER knob to confirm the setting.

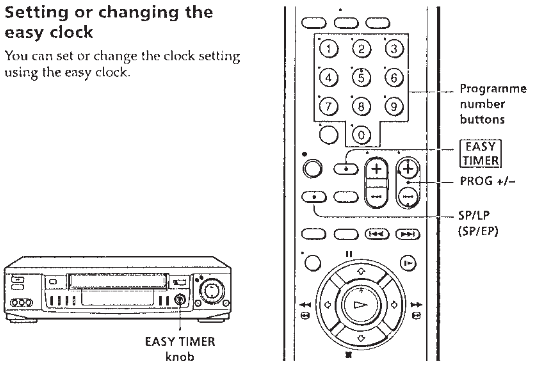
The ⏲ indicator appears in the display window and the VCR stands by for recording.



continued

Setting or changing the easy clock

You can set or change the clock setting using the easy clock.

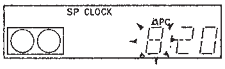


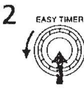
1

To change the clock setting, press the EASY TIMER knob on the VCR for more than three seconds.

The CLOCK indicator and the current clock setting appear in the display window.

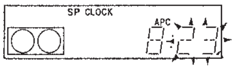
If the clock has not been set yet, "–:– –" appears in the display window.



2 

Set the current time using the EASY TIMER knob.

1 Turn the EASY TIMER knob clockwise or counterclockwise to enter the current hour.
2 Press the EASY TIMER knob to confirm the hour setting.
3 Turn the EASY TIMER knob to increase or decrease the minutes setting by a minute.

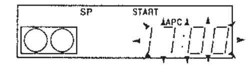


3

Press the EASY TIMER knob to confirm the clock setting.

The VCR enters the timer recording setting mode.

To continue the easy timer setting, go to step 2 in "Setting the easy timer" on page 26.



To quit the easy timer setting mode without changing any settings, press the EASY TIMER knob repeatedly until the ⏲ indicator appears in the display window.

To set the timer and clock setting using the remote commander

You can also use the remote commander to set the easy timer and easy clock. The operations on the VCR and the remote commander correspond as follows:

To	Do this on the VCR	Do this on the remote commander
Confirm the setting and go to the next setting	Press EASY TIMER knob	Press EASY TIMER
Change the time by 15 minutes (in START/STOP mode)	Turn EASY TIMER knob or hold PROGRAM +/– down	Hold PROG +/– down
Change the time by one minute (in START/STOP mode)	Press PROGRAM +/–	Press PROG +/–
Select the programme	Turn EASY TIMER knob or press PROGRAM +/– or INPUT SELECT	Press PROG +/– or INPUT SELECT
Change the hour/minute by one hour/minute (in CLOCK mode)	Turn EASY TIMER knob or press PROGRAM +/–	Press PROG +/–

You can also use the programme number buttons to set the clock, start and stop times, and the programme you want to record. Just press the programme number buttons to enter the hours and minutes. For example:

- To set the clock to "8:20", press 0, 8, EASY TIMER, 2, 0 and EASY TIMER in sequence.
- To set the start or stop time to "8:20", press 0, 8, 2, 0 and EASY TIMER in sequence.

If you make a mistake, re-enter the correct digits before pressing EASY TIMER.

continued

To stop recording

To stop the VCR while recording, press ■ STOP.

To check or change the timer setting

Press EASY TIMER knob repeatedly until the setting you want to check or change flashes. Then re-enter the new setting, if necessary. If you do not want to change any of the settings, press the EASY TIMER knob repeatedly until the ⏲ indicator appears in the display window.

You can also change the timer setting using the TIMER SET/CHECK menu. For details, see page 39.

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press ON/STANDBY. The ⏲ indicator turns off and the VCR switches on. Remember to press ON/STANDBY to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

Tips

- To record from a source connected to LINE-1 IN, LINE-2 IN or LINE-3 IN (SAT IN) jacks, press INPUT SELECT or PROG +/– or turn the EASY TIMER knob to display "L1", "L2" or "L3" in the display window.
- To record NTSC signals, set the tape speed to SP or EP. To set to the EP mode, display "LP" in the display window.
- To cancel the easy timer setting, press CLEAR on the remote commander or press PROGRAM + and – on the VCR at the same time during any of the easy timer setting.

Notes

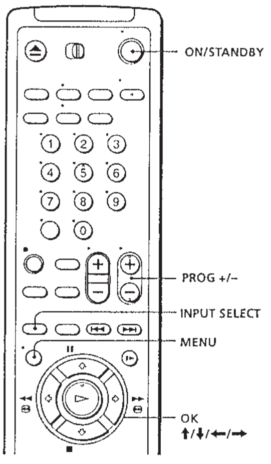
- You cannot set the easy timer if eight programmes have already been set.
- You can set the timer for only one programme using the easy timer. If you want to set the timer for other programmes, use the TIMER SET/CHECK menu. For details, see page 31.
- You cannot set the date using the easy timer. Set the date using the CLOCK SET menu if you want to set the timer with the menu. For details, see page 17.
- The ⏲ indicator flashes in the display window when you set the timer with no tape inserted.

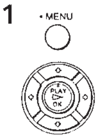
Setting the timer manually

You can preset up to eight programmes at a time.

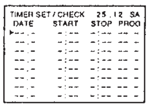
Before you start...

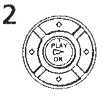
- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1 

Press MENU and select TIMER SET/CHECK, then press OK.

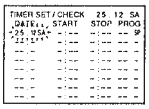


2 

Set the date, start and stop times, programme position, and tape speed:

1 Press → to flash each item in turn.
2 Press ↑/↓ to set each item.

To correct a setting, press ← to return to that setting and reset.



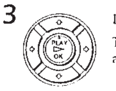
continued

Setting the timer manually (continued)

To record the same programme every day or the same day every week, press ⬇ while the date is flashing. For details, see "Daily/ weekly recording" below.

To record from a source connected to the LINE-1 IN, LINE-2 IN or LINE-3 IN (SAT IN) jacks; press INPUT SELECT or PROG +/– to display "L1", "L2" or "L3" in the "PROG" position.

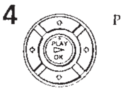
3



Press ➡ to confirm the setting.

The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4



Press OK.

5

Press ON/STANDBY to turn off the VCR.

The ⏲ indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

To stop recording

To stop the VCR while recording, press ■ STOP.

Daily/weekly recording

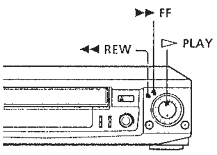
In step 2 above, press ⬇ to select the recording pattern. Each time you press ⬇, the indication changes as shown below. Press ⬆ to change the indication in reverse order.

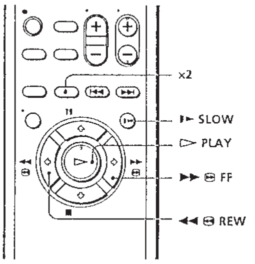
the current date → SU-SA (Sunday to Saturday) → MO-SA (Monday to Saturday) → MO-FR (Monday to Friday) → EVERY SA ..... → EVERY MO → EVERY SU → 1 month later → (dates count down) → the current date

Tips
- To set the programme position, you can also use the PROG +/– or programme number buttons.
- To set the tape speed, you can also use SP/LP (SP/EP).
- To record NTSC signals, set the tape speed to SP or EP. To set to the EP mode, display "LP" in the tape speed position.

Note
- The ⏲ indicator flashes in the display window when you press ON/STANDBY with no tape inserted.

Playing/searching at various speeds





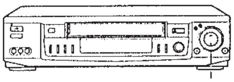
Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ ⊕ FF (▶▶ FF) down. During rewind, hold ◀◀ ⊖ REW (◀◀ REW) down.
Play at high speed	• During playback, press ▶▶ ⊕ FF or ◀◀ ⊖ REW on the remote commander. • During playback, hold ▶▶ ⊕ FF (▶▶ FF) or ◀◀ ⊖ REW (◀◀ REW) down. When you release the button, normal playback resumes.
Play at twice the normal speed	During playback or pause, press ×2.
Play in slow motion	During playback or pause, press I▶ SLOW.
Play frame by frame	During pause, press ▶▶ ⊕ FF or ◀◀ ⊖ REW on the remote commander. Hold the button down to play one frame each second.
Rewind and start play	During stop, press ▷ PLAY on the VCR while holding ◀◀ REW down on the VCR.

To resume normal playback

Press ▷ PLAY.

Playing/searching at various speeds (continued)

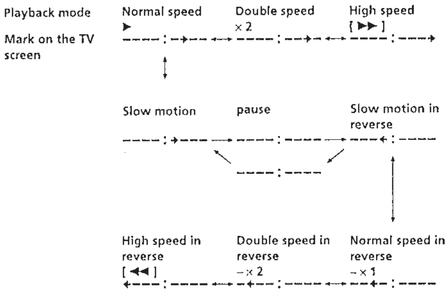
Using the CLICK SHUTTLE ring



CLICK SHUTTLE ring

With the CLICK SHUTTLE ring, you can operate a variety of playback options.

During playback or pause, turn the CLICK SHUTTLE ring clockwise or counterclockwise. Each change in the CLICK SHUTTLE ring position changes the playback mode, and the corresponding mark appears on the TV screen for a few seconds in the following way if the on-screen display function is on:



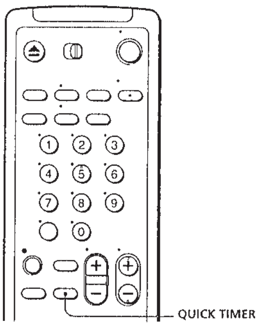
Tip
- Adjust the picture using TRACKING +/– on the VCR if:
  - – streaks appear while playing in slow motion.
  - – the picture shakes while pausing.

  To set tracking to the center position, press both buttons (+/–) at the same time.

Notes
- The playback sound is muted during these operations.
- In LP or EP mode, noise may appear or there may be no colour.
- The picture may have snow when playing at high speed in reverse.
- On screen symbols may shake while playing or searching at various speeds.

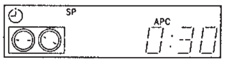
Recording TV programmes using the quick timer

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



1 While recording, press QUICK TIMER once.

The ⏲ indicator appears in the display window.



2 Press QUICK TIMER repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

→ 0:00 → 0:30 → 1:00 ----→ 10:30 → 11:00

The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press QUICK TIMER repeatedly to set to the new duration.

To stop recording

To stop the VCR while recording, press ■ STOP.

Using the quick timer during stop mode

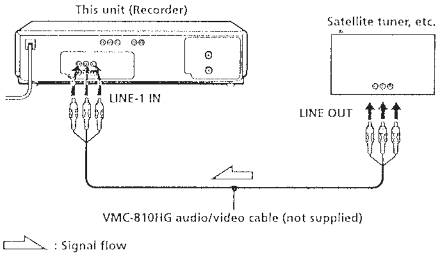
You can set the quick timer and start recording during stop mode by pressing QUICK TIMER. To set the channel, you can use the PROG +/– or INPUT SELECT buttons. Press QUICK TIMER repeatedly to set the recording duration. The recording will start automatically.

Synchronised recording

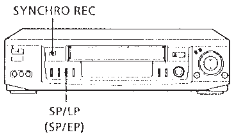
The Synchronised Recording feature enables you to record from the connected equipment such as a satellite tuner, a cable TV decoder or a TV that has a timer function. Once you set the timer on the other equipment, the unit will start recording the programme synchronised with the timer.

How to connect to use this function

Connect the other equipment to the LINE-1 IN jacks of this unit.



To prepare the Synchronised recording



1 Set the timer on the equipment to the time of the programme you want to record, then turn it off.

2 Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.

3 Press SP/LP (SP/EP) to select the tape speed (SP or LP for the PAL colour system, and SP or EP for the NTSC colour system.)

4 Hold SYNCHRO REC down for more than two seconds.

The SYNCHRO REC button lights up and the unit stands by for recording.

The unit automatically turns on and starts recording when it receives video/audio signals from the connected equipment.

To cancel the Synchronised recording

Press SYNCHRO REC so that the button's light turns off.

To stop recording

Press ■ STOP while recording.

The unit automatically stops recording when the tape reaches the end or when the other equipment stops transmitting the video/audio signals.

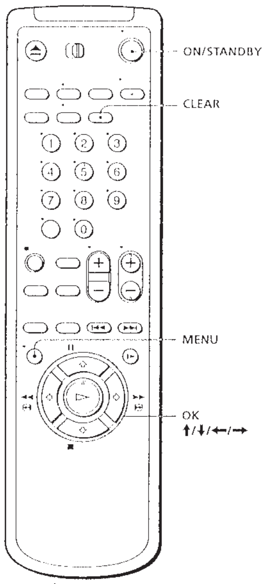
Notes

- Some TVs or other equipment automatically turn off in a certain time if you do not operate it after it turns on with the timer. In this case the Synchronised Recording also stops automatically.
- The Synchronised Recording starts and stops according to the signals from the connected equipment. Refer also to the instruction manual of the connected equipment for its timer function.
- If the settings for Timer Recording and Synchronised Recording overlap, the programme that starts first has priority and the second programme starts recording only after the first programme has finished.

Checking/ changing/ cancelling timer settings

Before you start…

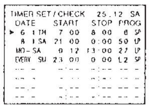
- Turn on your TV and set it to the video channel.



1 Press ON/STANDBY to turn on the VCR.

2 Press MENU, then select TIMER SET/CHECK:

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press OK, then turn off the VCR to return to recording standby.



```
TIMER SET / CHECK    25 . 12  SA
  DATE       START     STOP  PROG
▶ 6  1 TH    7  00    8  00   8  SP
  8  1 SA   21  00    0 : 00  50 LP
  MO - SA    0  12   13 : 00  27 LP
  EVERY  SU 23  00    0  00  12  SP
  -- -      -- : --   -- : -- -- -
  -- -      -- : --   -- : -- -- -
  -- -      -- : --   -- : -- -- -
  -- -      -- : --   -- : -- -- -
```

3 Press ↑/↓ to select the setting you want to change or cancel:

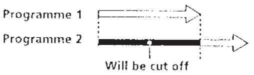
- To change the setting, press ←/→ to flash the item you want to change, and press ↑/↓ to re-set it. Then, press → repeatedly until the cursor (▶) appears at the beginning of the line.
- To cancel the setting, press CLEAR.

4 Press OK.

If any timer settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

In ZWEITON (German stereo) system

This VCR automatically receives and records stereo and bilingual programmes based on the ZWEITON system. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To select bilingual sound while recording

Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO

In NICAM system

This VCR receives and records stereo and bilingual programmes based on the NICAM system (the NICAM indicator appears). When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To record a NICAM programme, HIFI AUDIO in the SET UP MENU should be set to NICAM (initial setting). To check the menu setting, see page 44 for details.

To select the sound while recording

Press AUDIO MONITOR to select the sound you want.

Stereo programme

To listen to	On-screen display	Display window
Stereo	STEREO	STEREO
Standard sound*	No indicator	No indicator

* Usually the mixed sound of left and right channels (monaural)

Bilingual programme

To listen to	On-screen display	Display window
Main	MAIN	STEREO
Sub	SUB	STEREO
Main and sub	MAIN/SUB	STEREO
Standard sound*	No indicator	No indicator

* Usually the main sound (monaural)

Selecting the sound while playing

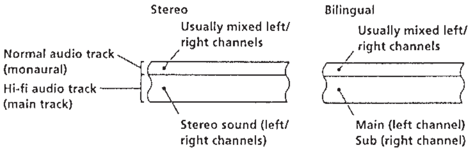
Press AUDIO MONITOR to select the sound you want.

To listen to	On-screen display	Display window
Stereo/main and sub (left and right channels)	STEREO	STEREO
Left channel/main	LCH	STEREO
Right channel/sub	RCH	STEREO
Standard sound*	No indicator	No indicator

* The mixed sound of left and right channels (monaural)

How sound is recorded on a video tape

The VCR records sounds onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

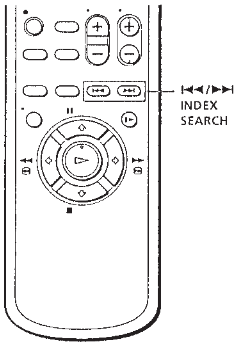

Stereo
Bilingual
Usually mixed left/right channels
Usually mixed left/right channels
Normal audio track (monaural)
Hi-fi audio track (main track)
Stereo sound (left/right channels)
Main (left channel)
Sub (right channel)

Notes

- To listen to playback sounds in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HIFI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

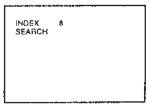
Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position.



1 Insert an indexed tape into the VCR.
2 Press ⏮/⏭ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:
   - To search ahead, press ⏭ INDEX SEARCH.
   - To search backwards, press ⏮ INDEX SEARCH.

   The VCR starts searching and the index number on the TV screen counts down to zero. The playback starts from the point about five seconds ahead of the specified index mark.



```
INDEX      8
SEARCH
```

To stop searching

Press ■ STOP.

Note

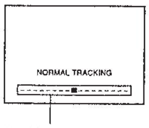
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the ⊠ indicator flashes in the display window, then goes off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

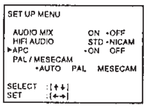
Press the TRACKING +/– buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons (the ⊠ indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (with the APC indicator in the display window lit).



```
SET UP MENU

 AUDIO MIX          ON  •OFF
 HIFI AUDIO         STD •NICAM
▶APC               •ON   OFF
 PAL / MESECAM
      •AUTO   PAL   MESECAM

SELECT  :[↑↓]
SET     :[←→]
```

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

To deactivate the APC

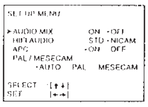
Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window goes off.

Note

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press ● REC to have the VCR analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press ❚❚ PAUSE to start recording immediately. If you press ❚❚ PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Changing menu options

1 Press MENU, then select SET UP MENU.


SET UP MENU
▶AUDIO MIX ON ·OFF
HIFI AUDIO STD ·NICAM
APC ·ON OFF
PAL / MESECAM
·AUTO PAL MESECAM
SELECT [↑↓]
SET [←→]

2 Press ↑/↓ to select the option to change, then press ←/→ to change the setting.

3 Press OK to return to the original screen.

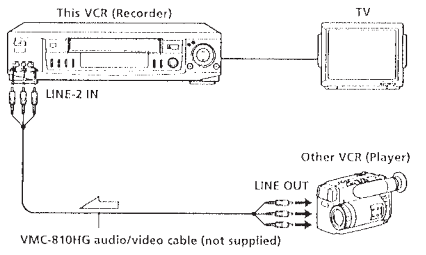
Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUDIO MIX	ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function. **OFF** to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button.
HIFI AUDIO	STD to record standard sound on the hi-fi audio track. **NICAM** to record NICAM broadcasts on the hi-fi audio track. For details, see page 40.
APC	**ON** to switch on the APC (Adaptive Picture Control) function and improve picture quality. OFF to switch off APC.
PAL/MESECAM	**AUTO** to have the VCR automatically select the colour system for recording and playback. If the picture has no colour or unusual colours, set to PAL or MESECAM according to your local colour system.

Connecting to a VCR or stereo system

How to connect to record on this VCR



How to connect to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510KS audio cable (not supplied).

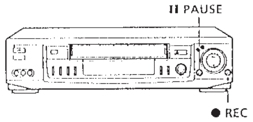
Notes
- Make sure you connect the plugs to jacks of the same colour.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

Tips
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- You can also use the LINE-1 IN or LINE-3 IN (SAT IN) jacks instead. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied).

Basic editing (when recording on this VCR)

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or PROG +/– to display "L1", "L2" or "L3" in the display window.
- Press SP/LP (SP/EP) to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).



1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR and set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

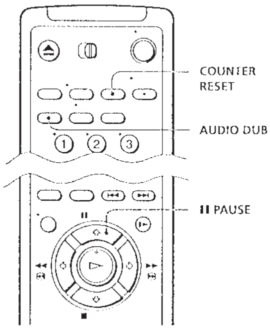
To stop editing

Press the ■ STOP buttons on both VCRs.

Tips
- To edit more precisely, press the II PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording.

Note
- If you start recording following the procedure above, the VCR will not start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press II PAUSE after the APC indicator stops flashing. If you press II PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Audio dubbing



This feature lets you record over the normal audio track. The monaural sound previously recorded is placed while the original hi-fi sound remains unchanged. Use this feature to add commentary to a tape that you have recorded with a camcorder.

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or PROG +/– to display "L1" or "L2" or "L3" in the display window.

1 Insert a source tape into the stereo system (or the playback VCR). Search for the point to start playback and set it to playback pause.

2 Insert a prerecorded tape into this (recording) VCR. Search for the end of the section to be replaced and press II PAUSE.
Make sure that the tape has its safety tab in place.

3 Press COUNTER RESET on this remote commander to reset the counter to "0:00:00."

4 Rewind the prerecorded tape to the beginning of the section to be replaced.

The VCR pauses.

5 Press AUDIO DUB.

The ⊖ indicator appears in the display window.

6 To start editing, press the II PAUSE buttons on this VCR and the stereo system (or other VCR) at the same time.

When the counter reaches "0:00:00" audio dubbing stops automatically.

To stop while editing

Press the ■ STOP buttons on this VCR and the stereo system (or other VCR).

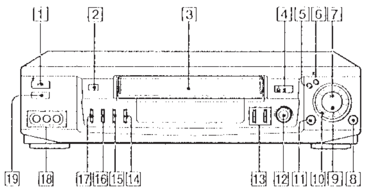
To listen to both the hi-fi and normal audio

Set AUDIO MIX to ON in the SET UP MENU (page 44). Use this feature to listen to dubbed audio over the original hi-fi audio. When AUDIO MIX is set to ON, the AUDIO MONITOR button does not function. Remember to reset AUDIO MIX to OFF after playing the tape.

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel



[1] I/⏻ ON/STANDBY switch/ indicator (8)

[2] SYNCHRO REC button (36)

[3] Tape compartment

[4] ≙ EJECT button (20)

[5] ◄◄ REW (rewind) button (20, 33)

[6] ►► FF (fast-forward) button (20, 33)

[7] ▷ PLAY button (20)

[8] ● REC (record) button (24)

[9] ■ STOP button (20)

[10] CLICK SHUTTLE ring (34)

[11] ❚❚ PAUSE button (20)

[12] EASY TIMER knob (26)

[13] PROGRAM/TRACKING +/– buttons (8, 43)

[14] ONE TOUCH TUNING/ RF (Radio Frequency) CHANNEL button (8, 11)

[15] SP (Standard Play)/LP (Long Play)/ EP (Extra Play) button (24)

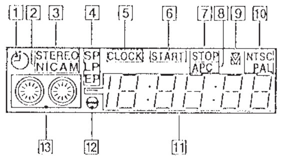
[16] COLOR SYSTEM button (20)

[17] INPUT SELECT button (25)

[18] LINE-2 IN VIDEO/AUDIO L/R jacks (45)

[19] Remote sensor (5)

Display window



[1] Timer indicator (27)

[2] NICAM indicator (40)

[3] STEREO indicator (40)

[4] Tape speed indicator (24)

[5] CLOCK indicator (28)

[6] START indicator (26)

[7] STOP indicator (26)

[8] APC (Adaptive Picture Control) indicator (43)

[9] Tracking indicator (43)

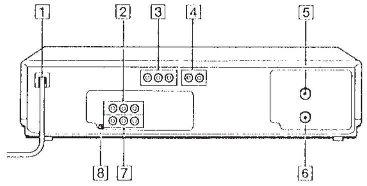
[10] Colour system indicator (20)

[11] Time counter/clock/line/ programme/TV system indicator (21, 23, 27, 35)

[12] Audio dubbing indicator (47)

[13] Tape/recording indicator (24)

Rear panel



[1] Mains lead (6)

[2] LINE-1 IN AUDIO R/L/VIDEO jacks (40)

[3] LINE-3 IN (SAT IN) AUDIO R/L/ VIDEO jacks (7)

[4] LINE-2 OUT (AUDIO) AUDIO R/L jacks (7)

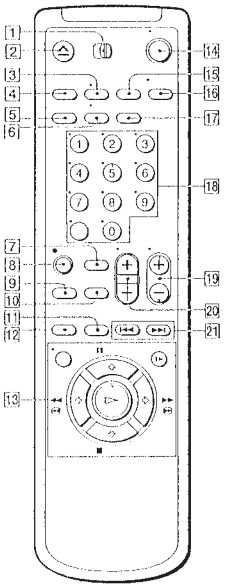
[5] AERIAL IN connector (6)

[6] AERIAL OUT connector (6)

[7] LINE-1 OUT AUDIO R/L/VIDEO jacks (6)

[8] NTSC PB (playback) switch (20)

Remote commander



[1] TV / VIDEO remote control switch (5)

[2] ⏏ EJECT button (20)

[3] DISPLAY button (24)

[4] TRINITRON TV SYNCHRO PLAY button (22)

[5] AUDIO DUB (dubbing) button (47)

[6] TV/VIDEO button *(for TV)* (5)

[7] EASY TIMER button (29)

[8] ● REC button (24)

[9] SP (Standard Play)/LP (Long Play)/ EP (Extra Play) button (24)

[10] QUICK TIMER button (35)

[11] ×2 button (33)

[12] INPUT SELECT button (25, 32)

[13] Tape/menu operation buttons

MENU button (10, 44)
❚❚ PAUSE/⬆ button (20)
■ STOP/⬇ button (20)
◄◄ ⊖ REW (rewind)/⬅ button (20, 33)
►► ⊕ FF (fast-forward)/➡ button (20, 33)
▷ PLAY/OK button (20)
❚► SLOW button (33)

[14] ON/STANDBY button (32)

[15] COUNTER RESET buttons (21)

[16] AUDIO MONITOR button (40)

[17] CLEAR button (39)

[18] Programme number /-/-- (ten's digit) buttons (29)

[19] PROG (programme) +/– buttons (23)

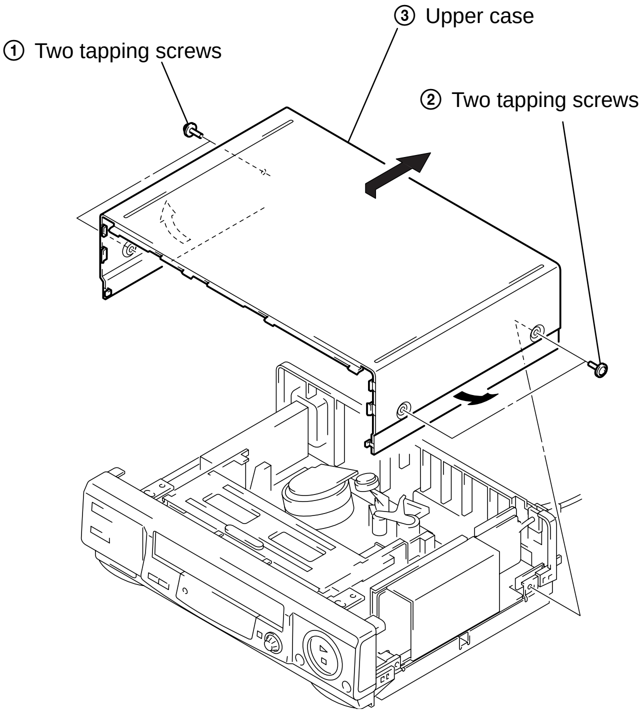
[20] VOL (volume) +/– buttons *(for TV)*

[21] ❙◄◄/►►❙ INDEX SEARCH buttons (42)

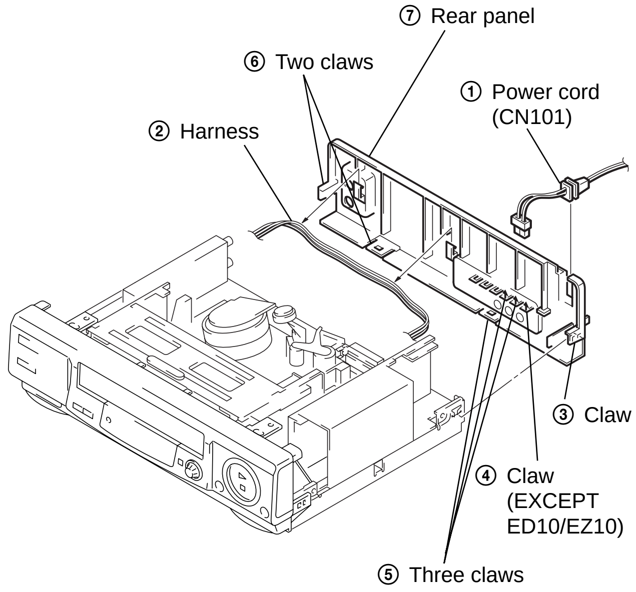
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

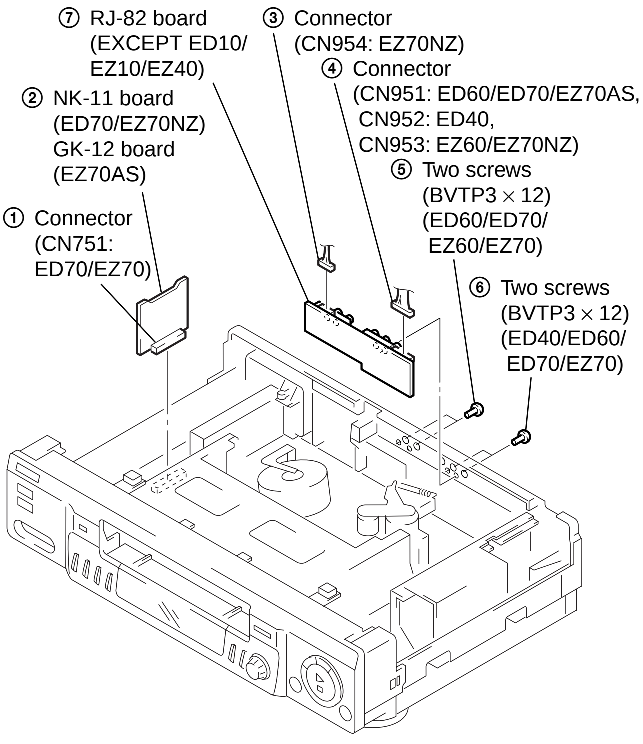
2-1. UPPER CASE REMOVAL


③ Upper case
① Two tapping screws
② Two tapping screws

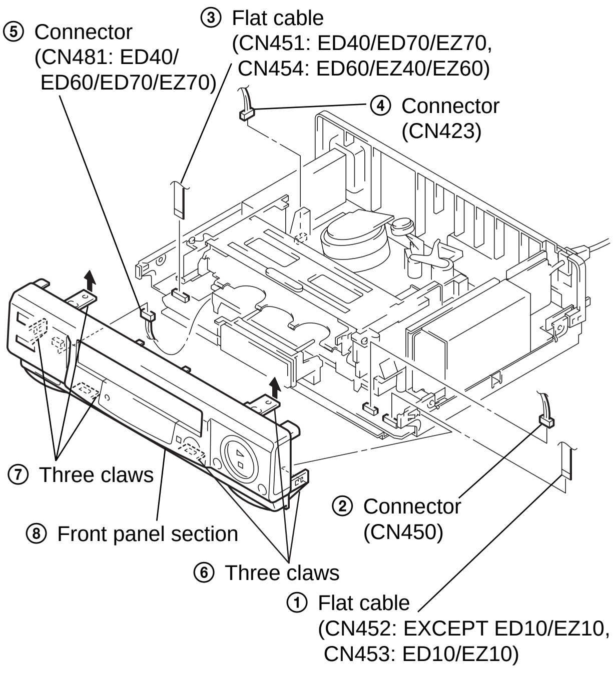
2-3. REAR PANEL REMOVAL


⑦ Rear panel
⑥ Two claws
① Power cord (CN101)
② Harness
③ Claw
④ Claw (EXCEPT ED10/EZ10)
⑤ Three claws

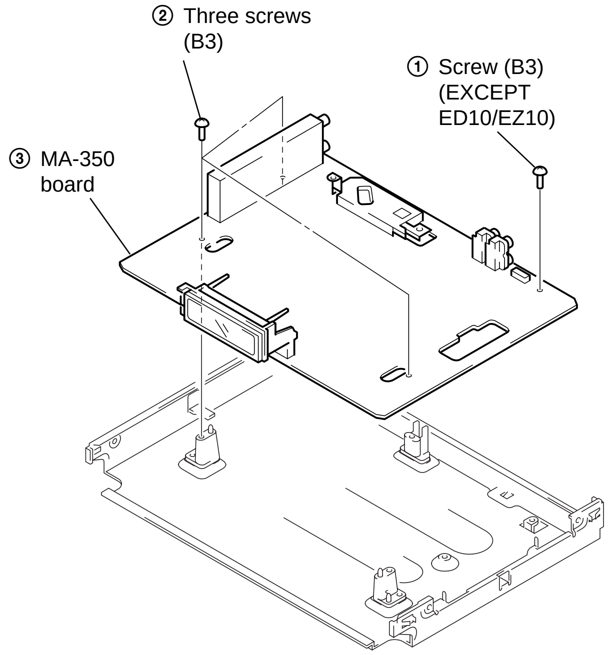
2-2. GK-12, NK-11, RJ-82 BOARD REMOVAL


⑦ RJ-82 board (EXCEPT ED10/ EZ10/EZ40)
③ Connector (CN954: EZ70NZ)
④ Connector (CN951: ED60/ED70/EZ70AS, CN952: ED40, CN953: EZ60/EZ70NZ)
② NK-11 board (ED70/EZ70NZ) GK-12 board (EZ70AS)
⑤ Two screws (BVTP3 × 12) (ED60/ED70/ EZ60/EZ70)
① Connector (CN751: ED70/EZ70)
⑥ Two screws (BVTP3 × 12) (ED40/ED60/ ED70/EZ70)

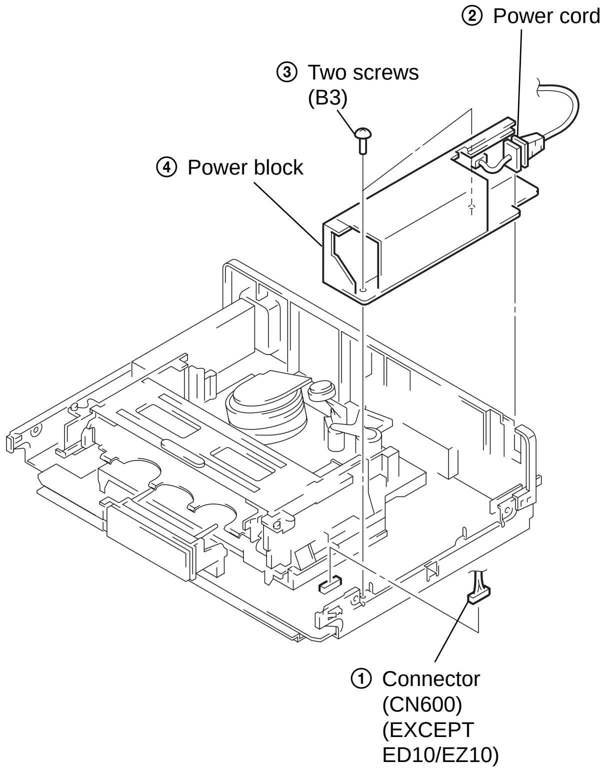
2-4. FRONT PANEL SECTION REMOVAL


⑤ Connector (CN481: ED40/ ED60/ED70/EZ70)
③ Flat cable (CN451: ED40/ED70/EZ70, CN454: ED60/EZ40/EZ60)
④ Connector (CN423)
⑦ Three claws
⑧ Front panel section
② Connector (CN450)
⑥ Three claws
① Flat cable (CN452: EXCEPT ED10/EZ10, CN453: ED10/EZ10)

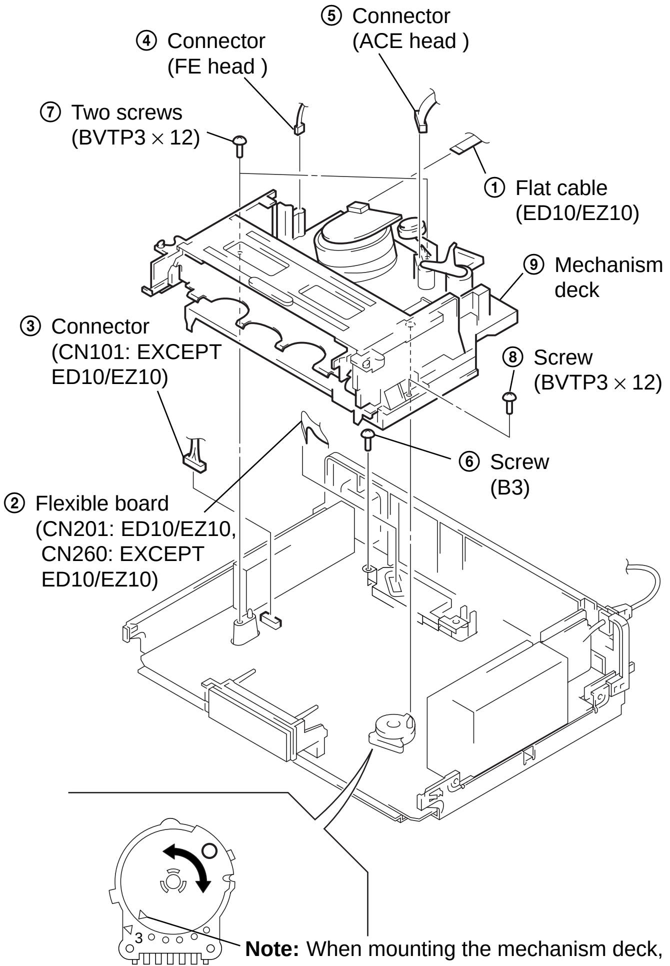
2-5. POWER BLOCK REMOVAL


② Three screws (B3)
① Screw (B3) (EXCEPT ED10/EZ10)
③ MA-350 board

2-7. MA-350 BOARD REMOVAL

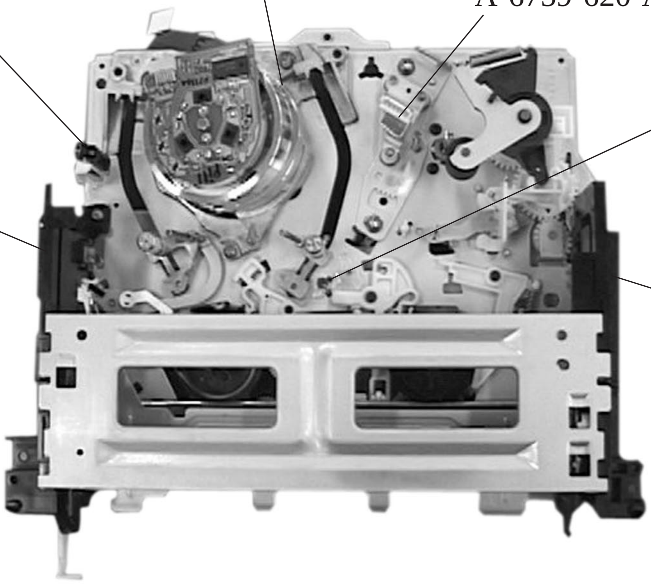

② Power cord
③ Two screws (B3)
④ Power block
① Connector (CN600) (EXCEPT ED10/EZ10)

2-6. MECHASISM DECK REMOVAL


⑤ Connector (ACE head)
④ Connector (FE head)
⑦ Two screws (BVTP3 × 12)
① Flat cable (ED10/EZ10)
⑨ Mechanism deck
③ Connector (CN101: EXCEPT ED10/EZ10)
⑧ Screw (BVTP3 × 12)
⑥ Screw (B3)
② Flexible board (CN201: ED10/EZ10, CN260: EXCEPT ED10/EZ10)
3

Note: When mounting the mechanism deck, first align △ mark on the rotary switch.

2-8. INTERNAL VIEWS



Drum assembly (M901) (DZH-89A-R)
1-759-453-11 (ED10/EZ10)
Drum assembly (M901) (DZH-74E/Z-RP)
8-839-037-04 (ED40/EZ40)
Drum assembly (M901) (DZH-95A/Z-RP)
8-839-045-02 (ED60/ED70/EZ60/EZ70)

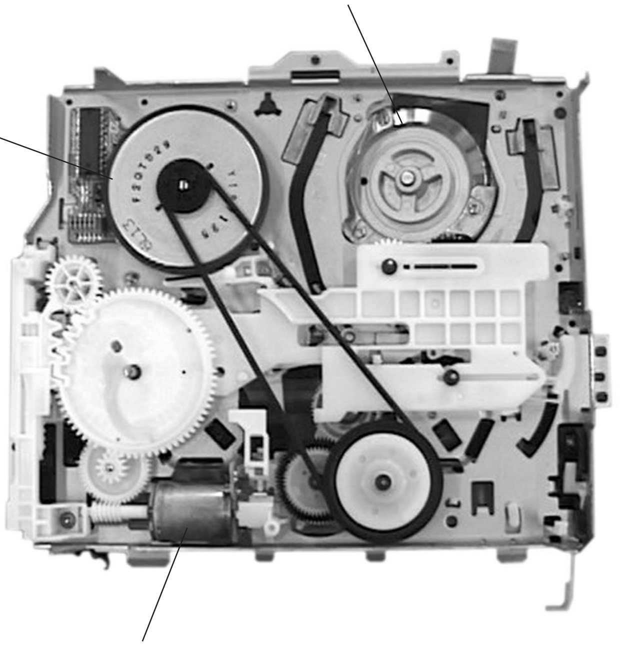
ACE head assembly
A-6759-620-A

FE head
1-500-144-11

D102
Tape top/end LED
8-719-048-26

Q100
Tape top sensor
8-729-043-84

Q101
Tape end sensor
8-729-043-84



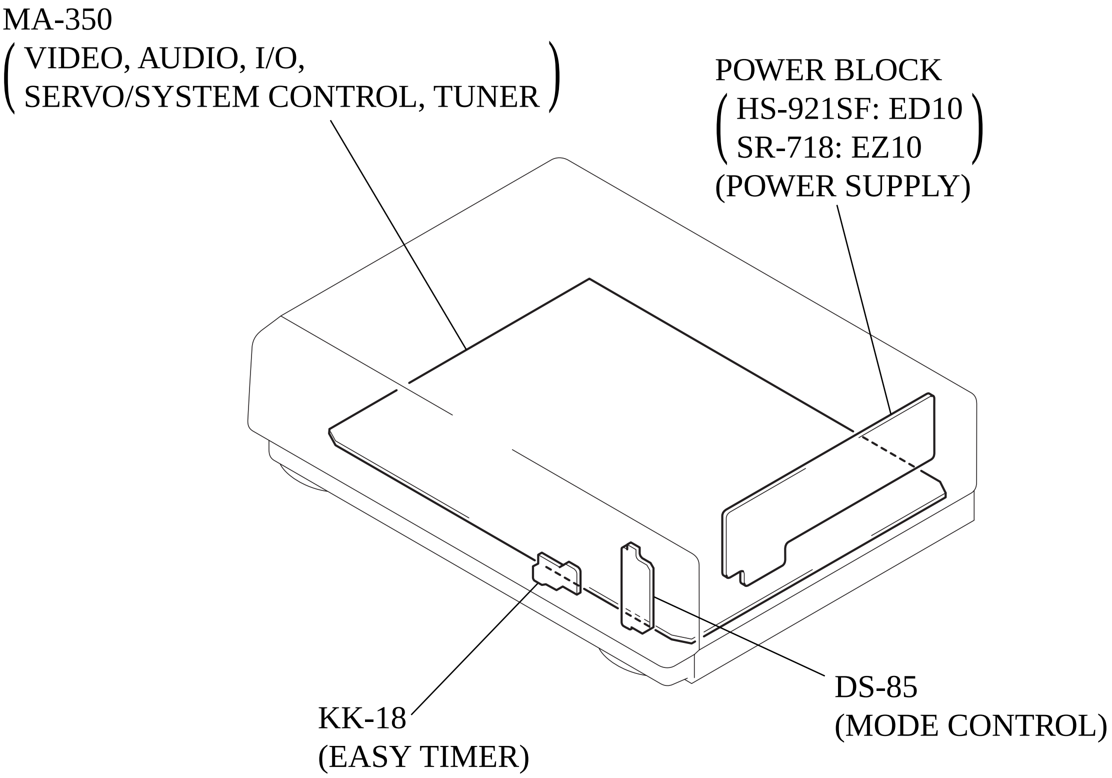
Drum assembly (M901) (DZH-89A-R)
1-759-453-11 (ED10/EZ10)
Drum assembly (M901) (DZH-74E/Z-RP)
8-839-037-04 (ED40/EZ40)
Drum assembly (M901) (DZH-95A/Z-RP)
8-839-045-02 (ED60/ED70/EZ60/EZ70)

Capstan motor
1-698-971-11

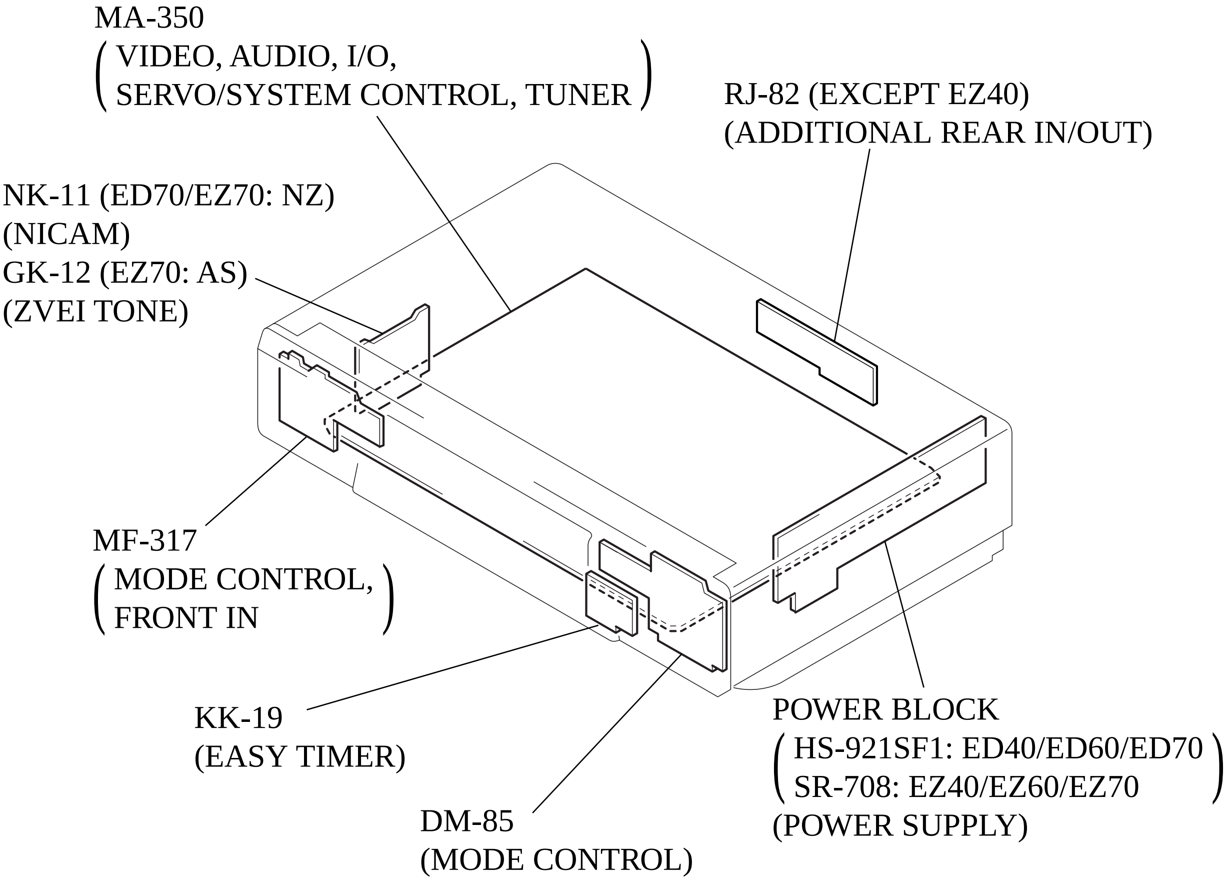
Cam motor assembly
X-3947-577-1

2-9. CIRCUIT BOARDS LOCATION

ED10/EZ10

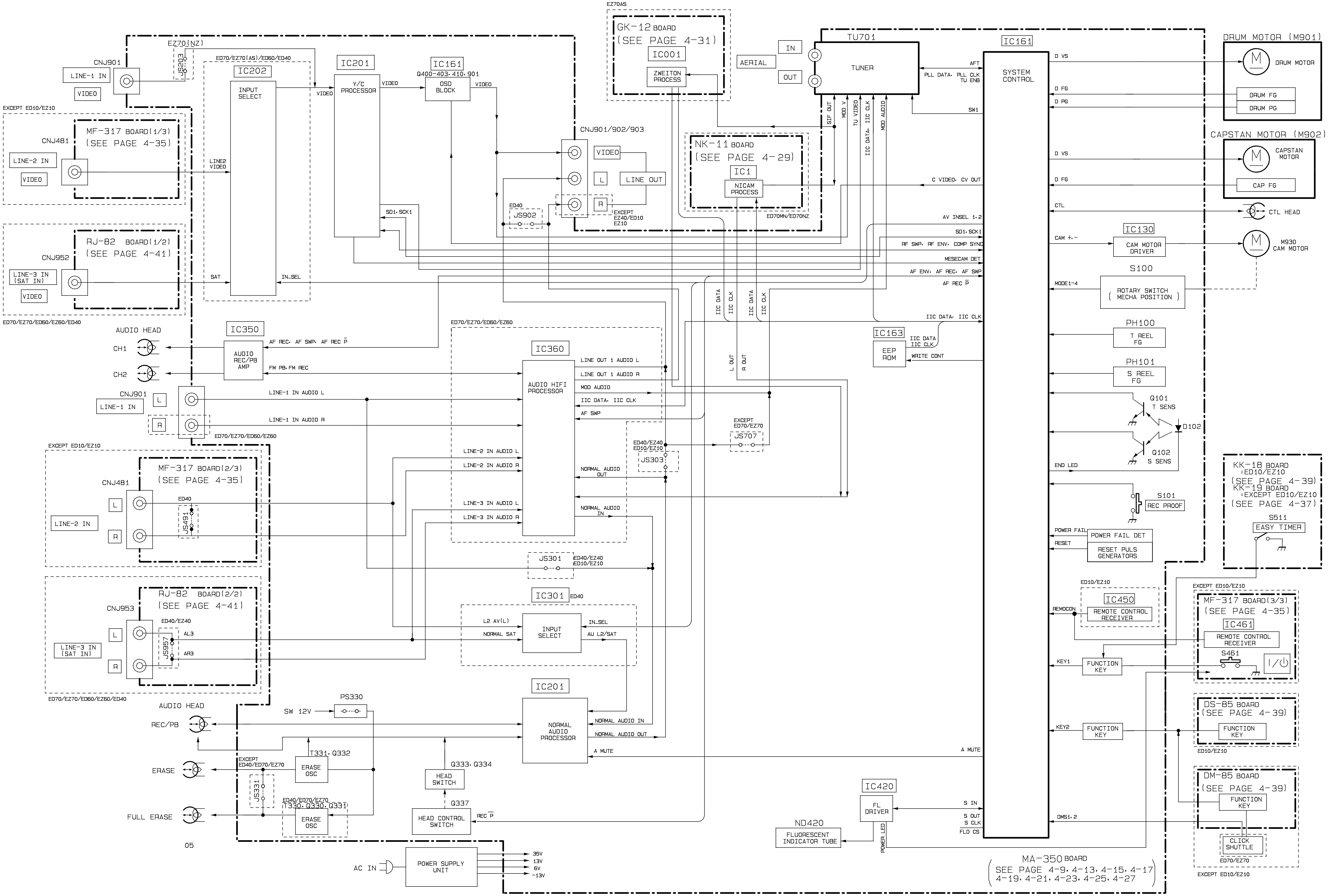

MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
POWER BLOCK
(HS-921SF: ED10
SR-718: EZ10)
(POWER SUPPLY)
KK-18
(EASY TIMER)
DS-85
(MODE CONTROL)

EXCEPT ED10/EZ10

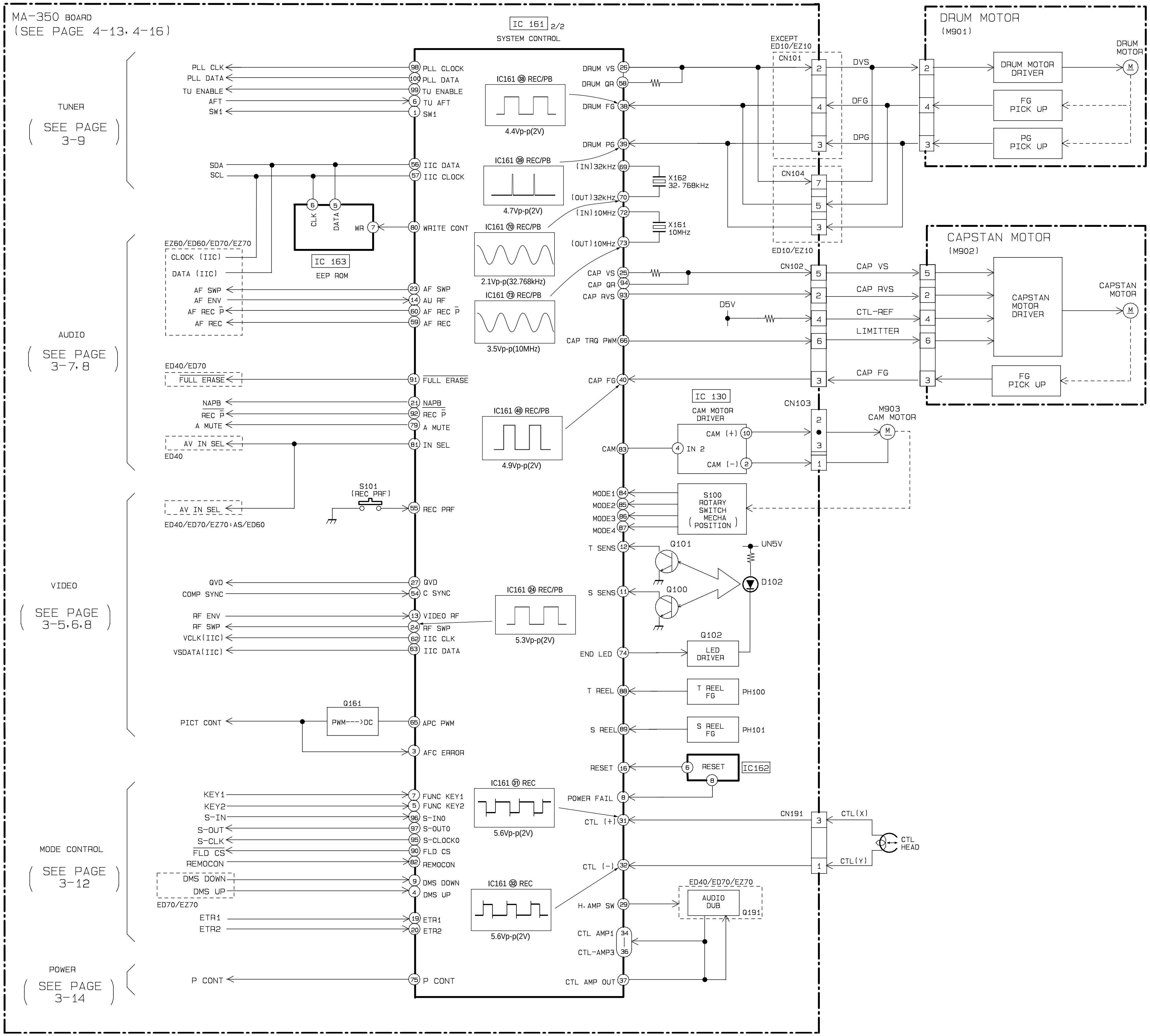

MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL,
FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)

SECTION 3
BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM


EZ70AS
GK-12 BOARD
(SEE PAGE 4-31)
IC001
ZWEITON PROCESS
EZ70(NZ)
CNJ901
LINE-1 IN
VIDEO
JS203
ED70/EZ70(AS)/ED60/ED40
IC202
INPUT SELECT
IC201
Y/C PROCESSOR
VIDEO
IC161
Q400-403, 410, 901
OSD BLOCK
VIDEO
EXCEPT ED10/EZ10
MF-317 BOARD(1/3)
(SEE PAGE 4-35)
CNJ481
LINE-2 IN
VIDEO
LINE2 VIDEO
RJ-82 BOARD(1/2)
(SEE PAGE 4-41)
CNJ952
LINE-3 IN (SAT IN)
VIDEO
SAT
IN_SEL
ED70/EZ70/ED60/EZ60/ED40
CNJ901/902/903
VIDEO
L
R
LINE OUT
ED40
JS902
EXCEPT EZ40/ED10 EZ10
SD1, SCK1
IN
OUT
AERIAL
TU701
TUNER
PLL DATA, PLL CLK TU ENB
AFT
SW1
SIF OUT
MOD V
TU VIDEO
IIC DATA, IIC CLK
MOD AUDIO
NK-11 BOARD
(SEE PAGE 4-29)
IC1
NICAM PROCESS
ED70MN/ED70NZ
IC161
SYSTEM CONTROL
C VIDEO, CV OUT
AV INSEL 1, 2
SD1, SCK1
RF SWP, RF ENV, COMP SYNC
MESECAM DET
AF ENV, AF REC, AF SWP
AF REC P
IIC DATA, IIC CLK
IIC DATA
IIC CLK
IIC DATA
IIC CLK
IC163
EEP ROM
IIC DATA IIC CLK
WRITE CONT
DRUM MOTOR (M901)
D VS
DRUM MOTOR
D FG
D PG
DRUM FG
DRUM PG
CAPSTAN MOTOR (M902)
D VS
CAPSTAN MOTOR
D FG
CAP FG
CTL
CTL HEAD
IC130
CAM +, -
CAM MOTOR DRIVER
M930 CAM MOTOR
S100
MODE1-4
ROTARY SWITCH (MECHA POSITION)
PH100
T REEL FG
PH101
S REEL FG
Q101 T SENS
D102
Q102 S SENS
END LED
S101
REC PROOF
POWER FAIL
POWER FAIL DET
RESET
RESET PULS GENERATORS
KK-18 BOARD :ED10/EZ10
(SEE PAGE 4-39)
KK-19 BOARD :EXCEPT ED10/EZ10
(SEE PAGE 4-37)
S511
EASY TIMER
AUDIO HEAD
CH1
CH2
IC350
AUDIO REC/PB AMP
AF REC, AF SWP, AF REC P
FM PB, FM REC
CNJ901
LINE-1 IN
L
R
LINE-1 IN AUDIO L
LINE-1 IN AUDIO R
ED70/EZ70/ED60/EZ60
ED70/EZ70/ED60/EZ60
IC360
AUDIO HIFI PROCESSOR
LINE OUT 1 AUDIO L
LINE OUT 1 AUDIO R
MOD AUDIO
IIC DATA, IIC CLK
AF SWP
L OUT
R OUT
EXCEPT ED70/EZ70
JS707
ED40/EZ40 ED10/EZ10
JS303
NORMAL AUDIO OUT
NORMAL AUDIO IN
LINE-2 IN AUDIO L
LINE-2 IN AUDIO R
LINE-3 IN AUDIO L
LINE-3 IN AUDIO R
EXCEPT ED10/EZ10
MF-317 BOARD(2/3)
(SEE PAGE 4-35)
CNJ481
L
R
LINE-2 IN
ED40
JS491
RJ-82 BOARD(2/2)
(SEE PAGE 4-41)
CNJ953
LINE-3 IN (SAT IN)
L
R
ED40/EZ40
AL3
AR3
JS957
ED70/EZ70/ED60/EZ60/ED40
JS301
ED40/EZ40 ED10/EZ10
IC301
ED40
INPUT SELECT
L2 AV(L)
NORMAL SAT
IN_SEL
AU L2/SAT
ED10/EZ10
IC450
REMOCON
REMOTE CONTROL RECEIVER
EXCEPT ED10/EZ10
MF-317 BOARD(3/3)
(SEE PAGE 4-35)
IC461
REMOTE CONTROL RECEIVER
S461
I/⏻
KEY1
FUNCTION KEY
AUDIO HEAD
REC/PB
SW 12V
PS330
IC201
NORMAL AUDIO PROCESSOR
NORMAL AUDIO IN
NORMAL AUDIO OUT
A MUTE
A MUTE
KEY2
FUNCTION KEY
DS-85 BOARD
(SEE PAGE 4-39)
FUNCTION KEY
ED10/EZ10
T331, Q332
EXCEPT ED40/ED70/EZ70
ERASE
ERASE OSC
Q333, Q334
HEAD SWITCH
JS331
ED40/ED70/EZ70
T330, Q330, Q331
FULL ERASE
ERASE OSC
Q337
HEAD CONTROL SWITCH
REC P
05
IC420
FL DRIVER
S IN
S OUT
S CLK
FLD CS
POWER LED
ND420
FLUORESCENT INDICATOR TUBE
DMS1, 2
DM-85 BOARD
(SEE PAGE 4-39)
FUNCTION KEY
CLICK SHUTTLE
ED70/EZ70
EXCEPT ED10/EZ10
AC IN
POWER SUPPLY UNIT
35V
13V
6V
-13V
MA-350 BOARD
(SEE PAGE 4-9, 4-13, 4-15, 4-17
4-19, 4-21, 4-23, 4-25, 4-27)

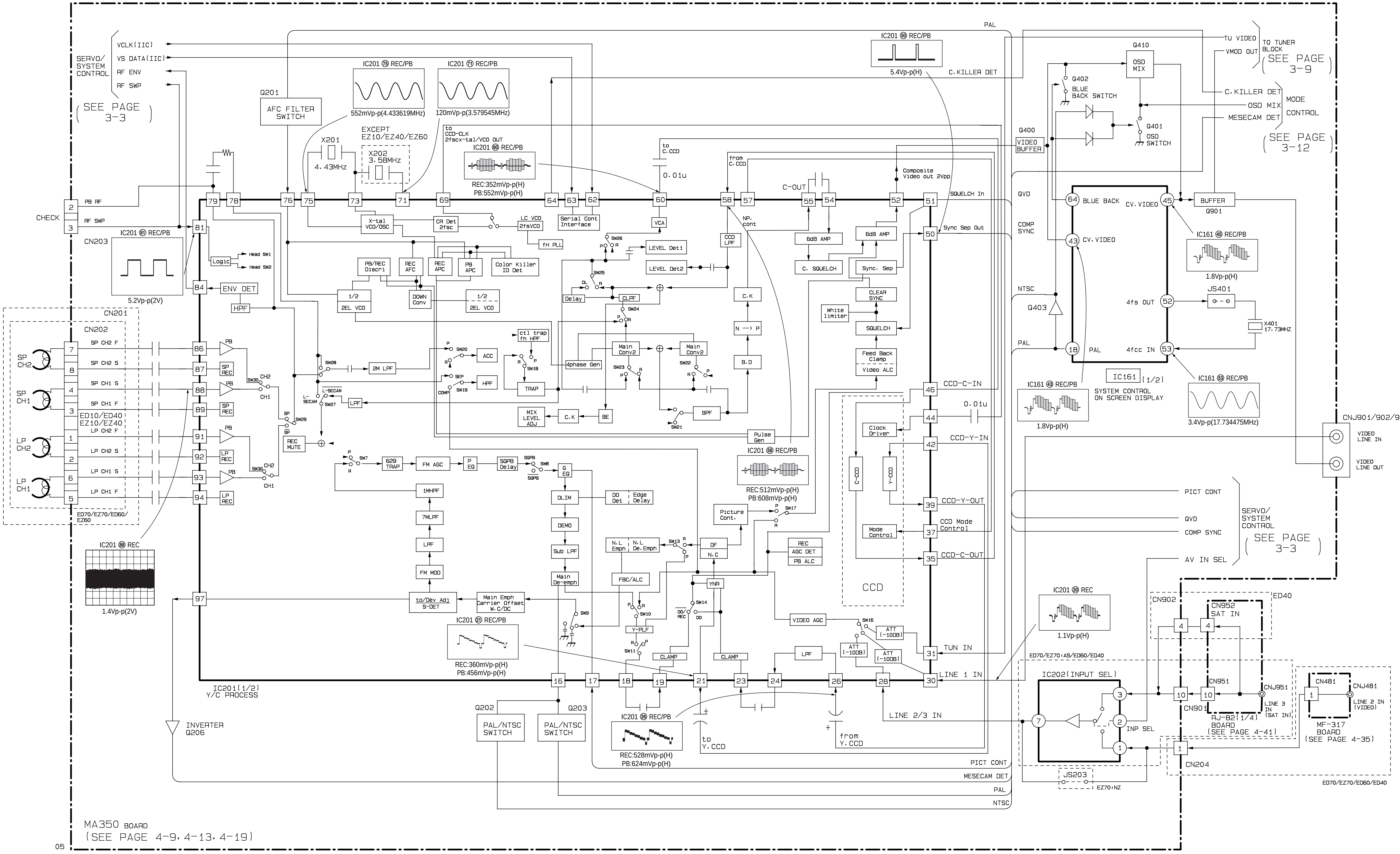
3-2. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



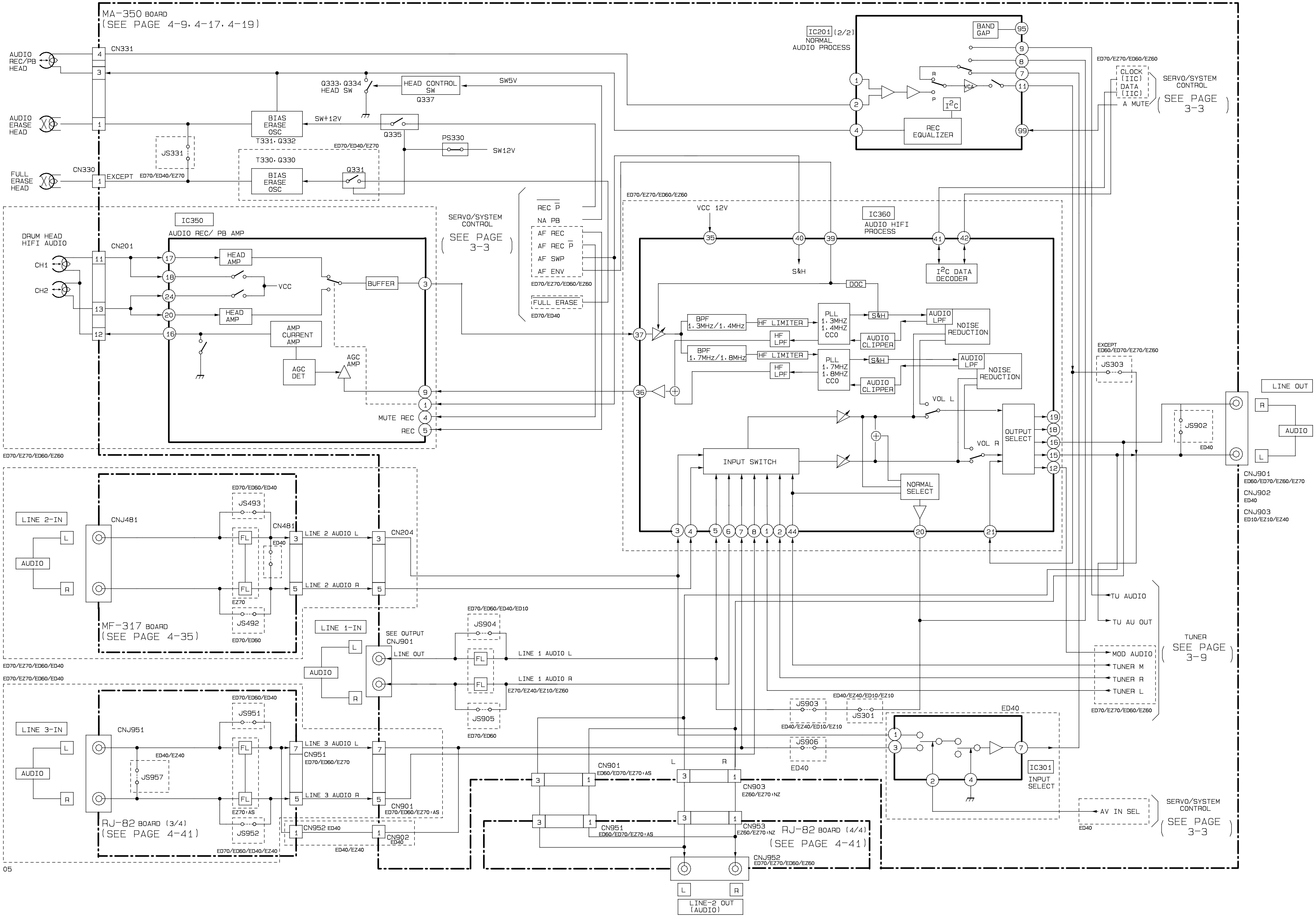
MA-350 BOARD
(SEE PAGE 4-13, 4-16)
IC 161 2/2
SYSTEM CONTROL
TUNER
(SEE PAGE 3-9)
PLL CLK
PLL DATA
TU ENABLE
AFT
SW1
98 PLL CLOCK
100 PLL DATA
99 TU ENABLE
6 TU AFT
1 SW1
IC161 26 REC/PB
4.4Vp-p(2V)
DRUM VS 26
DRUM GR 58
DRUM FG 38
DRUM PG 39
SDA
SCL
56 IIC DATA
57 IIC CLOCK
IC161 38 REC/PB
4.7Vp-p(2V)
(IN)32kHz 69
(OUT)32kHz 70
(IN)10MHz 72
(OUT)10MHz 73
X162 32.768kHz
X161 10MHz
CLK 6
DATA 5
WR 7
80 WRITE CONT
IC 163
EEP ROM
IC161 70 REC/PB
2.1Vp-p(32.768kHz)
IC161 73 REC/PB
3.5Vp-p(10MHz)
EZ60/ED60/ED70/EZ70
CLOCK (IIC)
DATA (IIC)
AF SWP
AF ENV
AF REC P
AF REC
23 AF SWP
14 AU RF
60 AF REC P
59 AF REC
AUDIO
(SEE PAGE 3-7, 8)
ED40/ED70
FULL ERASE
91 FULL ERASE
NAPB
REC P
A MUTE
AV IN SEL
ED40
21 NAPB
92 REC P
79 A MUTE
81 IN SEL
IC161 40 REC/PB
4.9Vp-p(2V)
CAP VS 25
CAP GR 94
CAP RVS 93
CAP TRQ PWM 66
CAP FG 40
S101 (REC PRF)
AV IN SEL
ED40/ED70/EZ70:AS/ED60
55 REC PRF
VIDEO
(SEE PAGE 3-5, 6, 8)
QVD
COMP SYNC
RF ENV
RF SWP
VCLK(IIC)
VSDATA(IIC)
27 QVD
54 C SYNC
13 VIDEO RF
24 RF SWP
62 IIC CLK
63 IIC DATA
IC161 24 REC/PB
5.3Vp-p(2V)
PICT CONT
Q161
PWM--->DC
65 APC PWM
3 AFC ERROR
MODE CONTROL
(SEE PAGE 3-12)
KEY1
KEY2
S-IN
S-OUT
S-CLK
FLD CS
REMOCON
DMS DOWN
DMS UP
ED70/EZ70
ETR1
ETR2
7 FUNC KEY1
5 FUNC KEY2
96 S-IN0
97 S-OUT0
95 S-CLOCK0
90 FLD CS
82 REMOCON
9 DMS DOWN
4 DMS UP
19 ETR1
20 ETR2
IC161 31 REC
5.6Vp-p(2V)
IC161 32 REC
5.6Vp-p(2V)
POWER
(SEE PAGE 3-14)
P CONT
75 P CONT
EXCEPT ED10/EZ10
CN101
DVS
DFG
DPG
CN104
ED10/EZ10
DRUM MOTOR
(M901)
DRUM MOTOR DRIVER
FG PICK UP
PG PICK UP
DRUM MOTOR
M
CAPSTAN MOTOR
(M902)
CN102
CAP VS
CAP RVS
CTL-REF
LIMITTER
CAP FG
D5V
CAPSTAN MOTOR DRIVER
CAPSTAN MOTOR
FG PICK UP
IC 130
CAM MOTOR DRIVER
CAM 83
4 IN 2
CAM (+) 10
CAM (-) 2
CN103
M903
CAM MOTOR
MODE1 84
MODE2 85
MODE3 86
MODE4 87
S100 ROTARY SWITCH (MECHA POSITION)
T SENS 12
S SENS 11
Q101
Q100
UN5V
D102
END LED 74
Q102
LED DRIVER
T REEL 88
T REEL FG
PH100
S REEL 89
S REEL FG
PH101
RESET 16
6 RESET 8
IC162
POWER FAIL 8
CTL (+) 31
CTL (-) 32
CN191
CTL(X)
CTL(Y)
CTL HEAD
H.AMP SW 29
ED40/ED70/EZ70
AUDIO DUB
Q191
CTL AMP1 34
CTL-AMP3 36
CTL AMP OUT 37

05

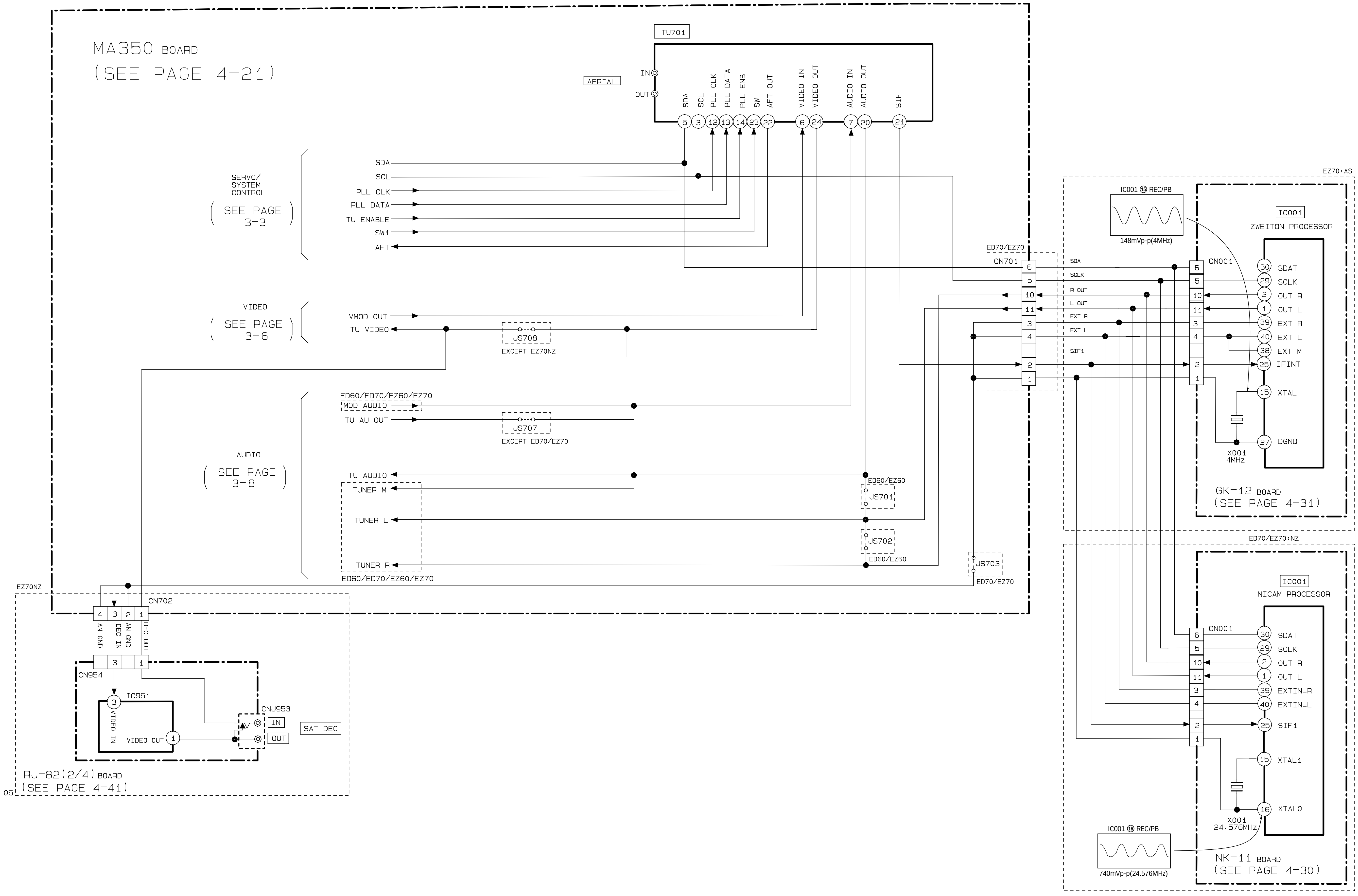
3-3. VIDEO BLOCK DIAGRAM


SERVO/ SYSTEM CONTROL
VCLK(IIC)
VS DATA(IIC)
RF ENV
RF SWP
(SEE PAGE 3-3)
CHECK
CN203
PB RF
RF SWP
IC201 81 REC/PB
5.2Vp-p(2V)
Q201
AFC FILTER SWITCH
IC201 75 REC/PB
552mVp-p(4.433619MHz)
IC201 71 REC/PB
120mVp-p(3.579545MHz)
X201
4.43MHz
EXCEPT EZ10/EZ40/EZ60
X202
3.58MHz
to CCD-CLK 2fscx-tal/VCO OUT
IC201 69 REC/PB
REC:352mVp-p(H)
PB:552mVp-p(H)
to C.CCD
0.01u
from C.CCD
C-OUT
Composite Video out 2Vpp
IC201 50 REC/PB
5.4Vp-p(H)
C.KILLER DET
PAL
SQUELCH In
Sync Sep Out
X-tal VCO/OSC
CR Det 2fsc
LC VCO 2fsVCO
fH PLL
Serial Cont Interface
VCA
CCD LPF
NP. cont
6dB AMP
C. SQUELCH
Sync. Sep
CLEAR SYNC
White limiter
SQUELCH
Feed Back Clamp
Video ALC
Logic
Head SW1
Head SW2
ENV DET
HPF
PB/REC Discri
REC AFC
REC APC
PB APC
Color Killer ID Det
1/2 2EL VCO
DOWN Conv
LEVEL Det1
LEVEL Det2
Delay
CLPF
C.K
N → P
B.D
ctl trap fh HPF
2M LPF
ACC
HPF
TRAP
4phase Gen
Main Conv2
Main Conv2
BPF
MIX LEVEL ADJ
C.K
BE
LPF
L-SECAM
REC MUTE
Pulse Gen
IC201 58 REC/PB
REC:512mVp-p(H)
PB:608mVp-p(H)
CN201
CN202
SP CH2 F
SP CH2 S
SP CH1 S
SP CH1 F
LP CH2 F
LP CH2 S
LP CH1 S
LP CH1 F
SP CH2
SP CH1
LP CH2
LP CH1
ED10/ED40 EZ10/EZ40
ED70/EZ70/ED60/EZ60
PB
SP REC
LP REC
CH1
CH2
SW7
629 TRAP
FM AGC
P EQ
SQPB Delay
G EQ
1MHPF
7MLPF
LPF
FM MOD
DLIM
DO Det
Edge Delay
DEMO
Sub LPF
Main De-emph
FBC/ALC
N.L Emph
N.L De.Emph
DF
N.C
YNR
Picture Cont.
REC AGC DET
PB ALC
Y-PLF
CLAMP
CLAMP
LPF
VIDEO AGC
ATT (-10DB)
ATT (-10DB)
ATT (-10DB)
to/Dev Adj S-DET
Main Emph Carrier Offset W.C/DC
IC201 97 REC
1.4Vp-p(2V)
IC201 21 REC/PB
REC:360mVp-p(H)
PB:456mVp-p(H)
IC201 20 REC/PB
REC:528mVp-p(H)
PB:624mVp-p(H)
to Y.CCD
from Y.CCD
IC201(1/2) Y/C PROCESS
INVERTER Q206
Q202
PAL/NTSC SWITCH
Q203
PAL/NTSC SWITCH
LINE 2/3 IN
TUN IN
LINE 1 IN
PICT CONT
MESECAM DET
PAL
NTSC
CCD-C-IN
0.01u
CCD-Y-IN
CCD-Y-OUT
CCD Mode Control
CCD-C-OUT
Clock Driver
C-CCD
Y-CCD
Mode Control
CCD
Q400
VIDEO BUFFER
Q402
BLUE BACK SWITCH
Q410
OSD MIX
Q401
OSD SWITCH
TU VIDEO
VMOD OUT
TO TUNER BLOCK
(SEE PAGE 3-9)
C.KILLER DET
OSD MIX
MESECAM DET
MODE CONTROL
(SEE PAGE 3-12)
QVD
COMP SYNC
BLUE BACK
CV.VIDEO
CV.VIDEO
BUFFER
Q901
IC161 45 REC/PB
1.8Vp-p(H)
NTSC
Q403
4fs OUT
JS401
X401 17.73MHZ
PAL
4fcc IN
IC161(1/2)
SYSTEM CONTROL ON SCREEN DISPLAY
IC161 43 REC/PB
1.8Vp-p(H)
IC161 53 REC/PB
3.4Vp-p(17.734475MHz)
CNJ901/902/903
VIDEO LINE IN
VIDEO LINE OUT
PICT CONT
QVD
COMP SYNC
AV IN SEL
SERVO/ SYSTEM CONTROL
(SEE PAGE 3-3)
IC201 30 REC
1.1Vp-p(H)
ED70/EZ70:AS/ED60/ED40
IC202(INPUT SEL)
INP SEL
JS203
EZ70:NZ
CN902
ED40
CN952 SAT IN
CN951
CNJ951
LINE 3 IN (SAT IN)
CN901
RJ-82(1/4) BOARD (SEE PAGE 4-41)
CN481
CNJ481
LINE 2 IN (VIDEO)
MF-317 BOARD (SEE PAGE 4-35)
CN204
ED70/EZ70/ED60/ED40
MA350 BOARD (SEE PAGE 4-9, 4-13, 4-19)
05

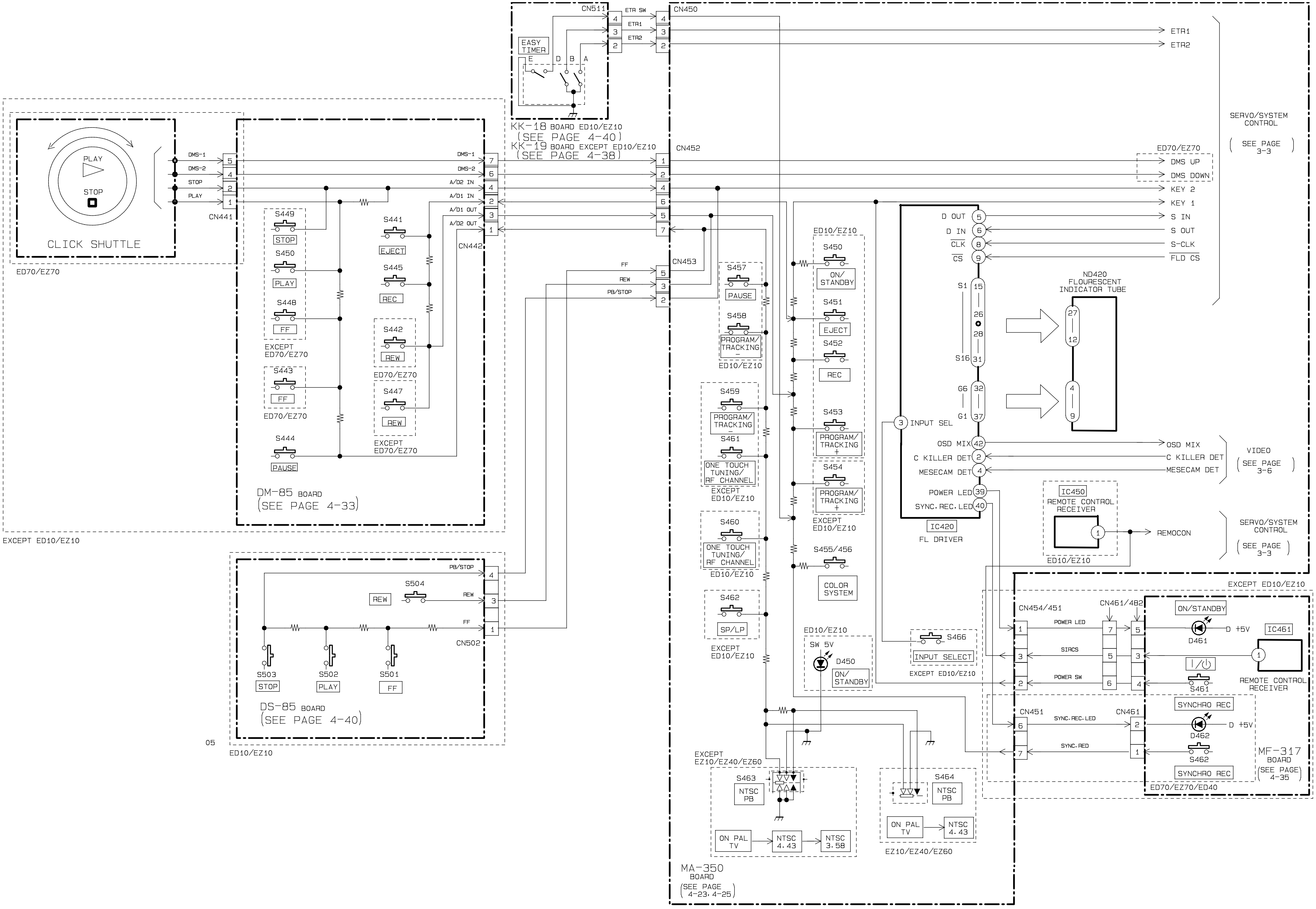
3-4. AUDIO BLOCK DIAGRAM


MA-350 BOARD
(SEE PAGE 4-9, 4-17, 4-19)
AUDIO REC/PB HEAD
CN331
AUDIO ERASE HEAD
FULL ERASE HEAD
CN330
EXCEPT
ED70/ED40/EZ70
JS331
BIAS ERASE OSC
T331, Q332
Q333, Q334 HEAD SW
HEAD CONTROL SW
Q337
SW5V
SW+12V
Q335
PS330
SW12V
ED70/ED40/EZ70
T330, Q330
BIAS ERASE OSC
Q331
IC201 (2/2)
NORMAL AUDIO PROCESS
BAND GAP
REC EQUALIZER
VCA
I2C
R
P
ED70/EZ70/ED60/EZ60
CLOCK (IIC)
DATA (IIC)
A MUTE
SERVO/SYSTEM CONTROL
SEE PAGE 3-3
DRUM HEAD HIFI AUDIO
CH1
CH2
CN201
IC350
AUDIO REC/ PB AMP
HEAD AMP
HEAD AMP
VCC
BUFFER
AMP CURRENT AMP
AGC DET
AGC AMP
MUTE REC
REC
ED70/EZ70/ED60/EZ60
SERVO/SYSTEM CONTROL
SEE PAGE 3-3
REC P
NA PB
AF REC
AF REC P
AF SWP
AF ENV
ED70/EZ70/ED60/EZ60
FULL ERASE
ED70/ED40
ED70/EZ70/ED60/EZ60
VCC 12V
IC360
AUDIO HIFI PROCESS
S&H
I2C DATA DECODER
DOC
BPF 1.3MHz/1.4MHz
HF LIMITER
PLL 1.3MHZ 1.4MHZ CCO
S&H
AUDIO LPF
NOISE REDUCTION
HF LPF
AUDIO CLIPPER
BPF 1.7MHz/1.8MHz
HF LIMITER
PLL 1.7MHZ 1.8MHZ CCO
S&H
AUDIO LPF
NOISE REDUCTION
HF LPF
AUDIO CLIPPER
VOL L
VOL R
OUTPUT SELECT
INPUT SWITCH
NORMAL SELECT
EXCEPT ED60/ED70/EZ70/EZ60
JS303
LINE OUT
R
L
AUDIO
JS902
ED40
CNJ901 ED60/ED70/EZ60/EZ70
CNJ902 ED40
CNJ903 ED10/EZ10/EZ40
LINE 2-IN
L
AUDIO
R
CNJ481
ED70/ED60/ED40
JS493
CN481
ED40
FL
FL
EZ70
JS492
ED70/ED60
LINE 2 AUDIO L
LINE 2 AUDIO R
CN204
MF-317 BOARD
(SEE PAGE 4-35)
ED70/EZ70/ED60/ED40
LINE 1-IN
L
AUDIO
R
SEE OUTPUT CNJ901
LINE OUT
ED70/ED60/ED40/ED10
JS904
FL
FL
LINE 1 AUDIO L
LINE 1 AUDIO R
EZ70/EZ40/EZ10/EZ60
JS905
ED70/ED60
TU AUDIO
TU AU OUT
TUNER
SEE PAGE 3-9
MOD AUDIO
TUNER M
TUNER R
TUNER L
ED70/EZ70/ED60/EZ60
ED70/EZ70/ED60/ED40
LINE 3-IN
L
AUDIO
R
CNJ951
ED40/EZ40
JS957
ED70/ED60/ED40
JS951
FL
FL
EZ70:AS
JS952
ED70/ED60/ED40/EZ40
LINE 3 AUDIO L
CN951 ED70/ED60/EZ70
LINE 3 AUDIO R
CN901 ED70/ED60/EZ70:AS
CN952 ED40
CN902 ED40
ED40/EZ40
RJ-82 BOARD (3/4)
(SEE PAGE 4-41)
05
JS903
ED40/EZ40/ED10/EZ10
ED40/EZ40/ED10/EZ10
JS301
JS906
ED40
CN901 ED60/ED70/EZ70:AS
L
R
CN903 EZ60/EZ70:NZ
CN951 ED60/ED70/EZ70:AS
CN953 EZ60/EZ70:NZ
RJ-82 BOARD (4/4)
(SEE PAGE 4-41)
CNJ952 ED70/EZ70/ED60/EZ60
L
R
LINE-2 OUT (AUDIO)
ED40
IC301
INPUT SELECT
AV IN SEL
ED40
SERVO/SYSTEM CONTROL
SEE PAGE 3-3

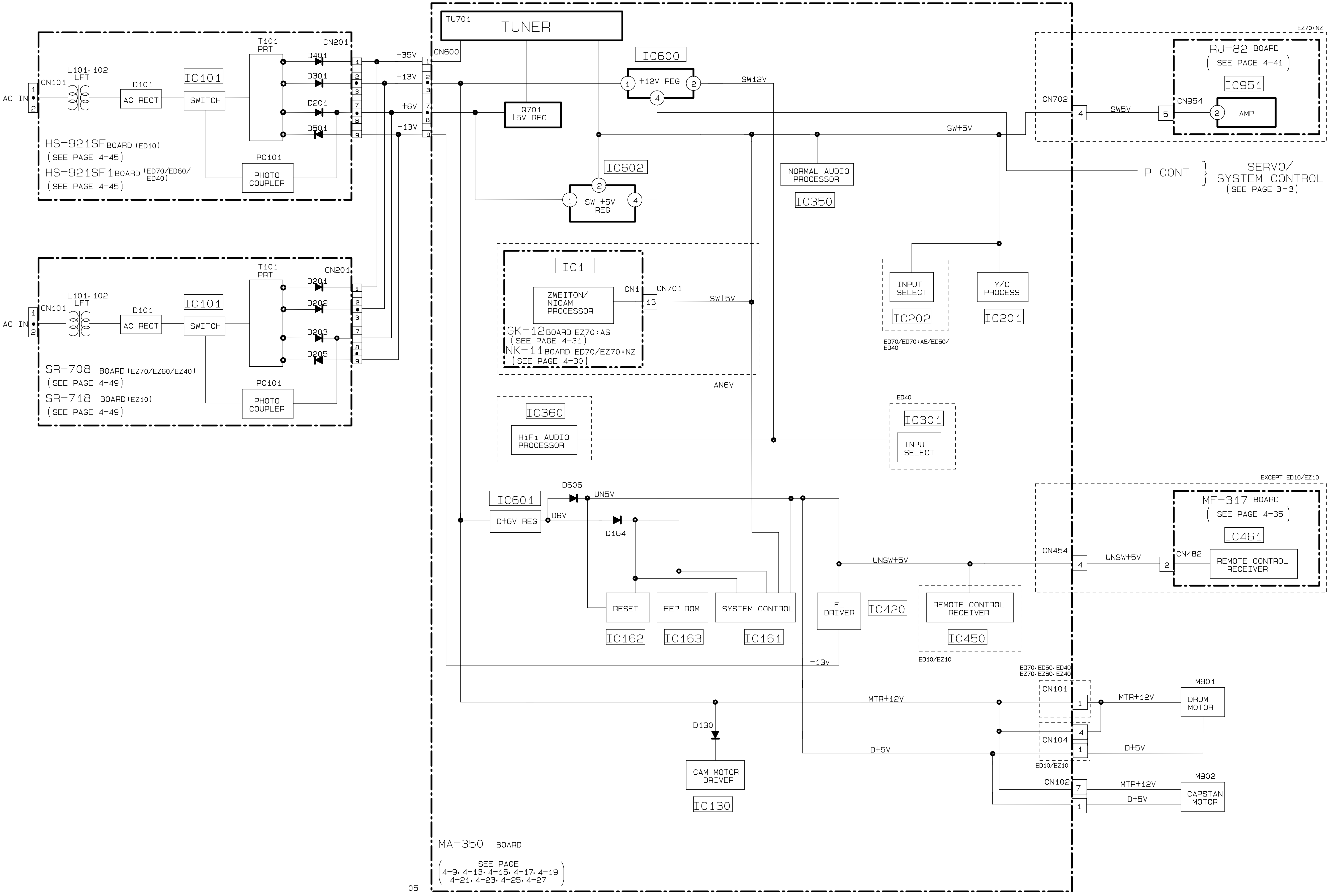
3-5. TUNER BLOCK DIAGRAM


MA350 BOARD
(SEE PAGE 4-21)
TU701
AERIAL
IN
OUT
SDA
SCL
PLL CLK
PLL DATA
PLL ENB
SW
AFT OUT
VIDEO IN
VIDEO OUT
AUDIO IN
AUDIO OUT
SIF
5
3
12
13
14
23
22
6
24
7
20
21
SERVO/
SYSTEM
CONTROL
(SEE PAGE 3-3)
SDA
SCL
PLL CLK
PLL DATA
TU ENABLE
SW1
AFT
VIDEO
(SEE PAGE 3-6)
VMOD OUT
TU VIDEO
JS708
EXCEPT EZ70NZ
ED60/ED70/EZ60/EZ70
MOD AUDIO
TU AU OUT
JS707
EXCEPT ED70/EZ70
AUDIO
(SEE PAGE 3-8)
TU AUDIO
TUNER M
TUNER L
TUNER R
ED60/ED70/EZ60/EZ70
ED60/EZ60
JS701
JS702
ED60/EZ60
JS703
ED70/EZ70
ED70/EZ70
CN701
6
5
10
11
3
4
2
1
SDA
SCLK
R OUT
L OUT
EXT R
EXT L
SIF1
EZ70:AS
IC001 ⑮ REC/PB
148mVp-p(4MHz)
IC001
ZWEITON PROCESSOR
CN001
30 SDAT
29 SCLK
2 OUT R
1 OUT L
39 EXT R
40 EXT L
38 EXT M
25 IFINT
15 XTAL
27 DGND
X001
4MHz
GK-12 BOARD
(SEE PAGE 4-31)
ED70/EZ70:NZ
IC001
NICAM PROCESSOR
CN001
30 SDAT
29 SCLK
2 OUT R
1 OUT L
39 EXTIN_R
40 EXTIN_L
25 SIF1
15 XTAL1
16 XTALO
X001
24.576MHZ
IC001 ⑯ REC/PB
740mVp-p(24.576MHz)
NK-11 BOARD
(SEE PAGE 4-30)
EZ70NZ
CN702
4
3
2
1
AN GND
DEC IN
AN GND
DEC OUT
CN954
3
1
IC951
VIDEO IN
VIDEO OUT
CNJ953
IN
OUT
SAT DEC
RJ-82(2/4) BOARD
(SEE PAGE 4-41)
05

3-6. MODE CONTROL BLOCK DIAGRAM


CN511
ETR SW
ETR1
ETR2
EASY TIMER
E D B A
KK-18 BOARD ED10/EZ10
(SEE PAGE 4-40)
KK-19 BOARD EXCEPT ED10/EZ10
(SEE PAGE 4-38)
CN450
CN452
CN453
ETR1
ETR2
SERVO/SYSTEM CONTROL
(SEE PAGE 3-3)
ED70/EZ70
DMS UP
DMS DOWN
KEY 2
KEY 1
S IN
S OUT
S-CLK
FLD CS
PLAY
STOP
CLICK SHUTTLE
DMS-1
DMS-2
STOP
PLAY
CN441
ED70/EZ70
DMS-1
DMS-2
A/D2 IN
A/D1 IN
A/D1 OUT
A/D2 OUT
CN442
S449
STOP
S450
PLAY
S448
FF
EXCEPT ED70/EZ70
S443
FF
ED70/EZ70
S444
PAUSE
S441
EJECT
S445
REC
S442
REW
ED70/EZ70
S447
REW
EXCEPT ED70/EZ70
DM-85 BOARD
(SEE PAGE 4-33)
EXCEPT ED10/EZ10
FF
REW
PB/STOP
PB/STOP
REW
FF
S504
REW
CN502
S503
STOP
S502
PLAY
S501
FF
DS-85 BOARD
(SEE PAGE 4-40)
05
ED10/EZ10
S457
PAUSE
S458
PROGRAM/ TRACKING −
ED10/EZ10
S459
PROGRAM/ TRACKING −
S461
ONE TOUCH TUNING/ RF CHANNEL
EXCEPT ED10/EZ10
S460
ONE TOUCH TUNING/ RF CHANNEL
ED10/EZ10
S462
SP/LP
EXCEPT ED10/EZ10
ED10/EZ10
S450
ON/ STANDBY
S451
EJECT
S452
REC
S453
PROGRAM/ TRACKING +
S454
PROGRAM/ TRACKING +
EXCEPT ED10/EZ10
S455/456
COLOR SYSTEM
ED10/EZ10
SW 5V
D450
ON/ STANDBY
EXCEPT EZ10/EZ40/EZ60
S463
NTSC PB
ON PAL TV
NTSC 4.43
NTSC 3.58
S464
NTSC PB
ON PAL TV
NTSC 4.43
EZ10/EZ40/EZ60
MA-350 BOARD
(SEE PAGE 4-23, 4-25)
D OUT
D IN
CLK
CS
S1
S16
G6
G1
3 INPUT SEL
OSD MIX
C KILLER DET
MESECAM DET
POWER LED
SYNC.REC.LED
IC420
FL DRIVER
ND420 FLOURESCENT INDICATOR TUBE
OSD MIX
C KILLER DET
MESECAM DET
VIDEO
(SEE PAGE 3-6)
IC450
REMOTE CONTROL RECEIVER
ED10/EZ10
REMOCON
SERVO/SYSTEM CONTROL
(SEE PAGE 3-3)
S466
INPUT SELECT
EXCEPT ED10/EZ10
EXCEPT ED10/EZ10
CN454/451
CN461/482
POWER LED
SIRCS
POWER SW
ON/STANDBY
D461
D +5V
IC461
I/⏻
S461
REMOTE CONTROL RECEIVER
CN451
CN461
SYNC.REC.LED
SYNC.REC
SYNCHRO REC
D462
D +5V
S462
SYNCHRO REC
MF-317 BOARD
(SEE PAGE 4-35)
ED70/EZ70/ED40

3-7. POWER BLOCK DIAGRAM


AC IN
CN101
L101, 102
LFT
D101
AC RECT
IC101
SWITCH
T101
PRT
CN201
D401
D301
D201
D501
PC101
PHOTO COUPLER
HS-921SF BOARD (ED10)
(SEE PAGE 4-45)
HS-921SF1 BOARD (ED70/ED60/ED40)
(SEE PAGE 4-45)
D201
D202
D203
D205
SR-708 BOARD (EZ70/EZ60/EZ40)
(SEE PAGE 4-49)
SR-718 BOARD (EZ10)
(SEE PAGE 4-49)
+35V
+13V
+6V
-13V
CN600
TU701
TUNER
Q701
+5V REG
IC600
+12V REG
SW12V
IC602
SW +5V REG
SW+5V
NORMAL AUDIO PROCESSOR
IC350
IC1
ZWEITON/ NICAM PROCESSOR
CN1
CN701
GK-12 BOARD EZ70:AS
(SEE PAGE 4-31)
NK-11 BOARD ED70/EZ70:NZ
(SEE PAGE 4-30)
AN6V
IC360
HiFi AUDIO PROCESSOR
INPUT SELECT
IC202
ED70/ED70:AS/ED60/ED40
Y/C PROCESS
IC201
ED40
IC301
INPUT SELECT
EZ70:NZ
RJ-82 BOARD
(SEE PAGE 4-41)
IC951
CN702
SW5V
CN954
AMP
P CONT
SERVO/ SYSTEM CONTROL
(SEE PAGE 3-3)
IC601
D+6V REG
D606
UN5V
D6V
D164
RESET
IC162
EEP ROM
IC163
SYSTEM CONTROL
IC161
FL DRIVER
IC420
REMOTE CONTROL RECEIVER
IC450
ED10/EZ10
UNSW+5V
-13V
EXCEPT ED10/EZ10
MF-317 BOARD
(SEE PAGE 4-35)
IC461
CN454
CN482
REMOTE CONTROL RECEIVER
ED70, ED60, ED40
EZ70, EZ60, EZ40
CN101
MTR+12V
M901
DRUM MOTOR
CN104
D+5V
ED10/EZ10
CN102
M902
CAPSTAN MOTOR
D130
CAM MOTOR DRIVER
IC130
MA-350 BOARD
SEE PAGE
(4-9, 4-13, 4-15, 4-17, 4-19
4-21, 4-23, 4-25, 4-27)
05

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary mote is printed in each block.)

For printed wiring board:

- o—— : indicates a lead wire mounted on the component side.
- ●—— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ■ : Parts mounted on the conductor side.
- ▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:

Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

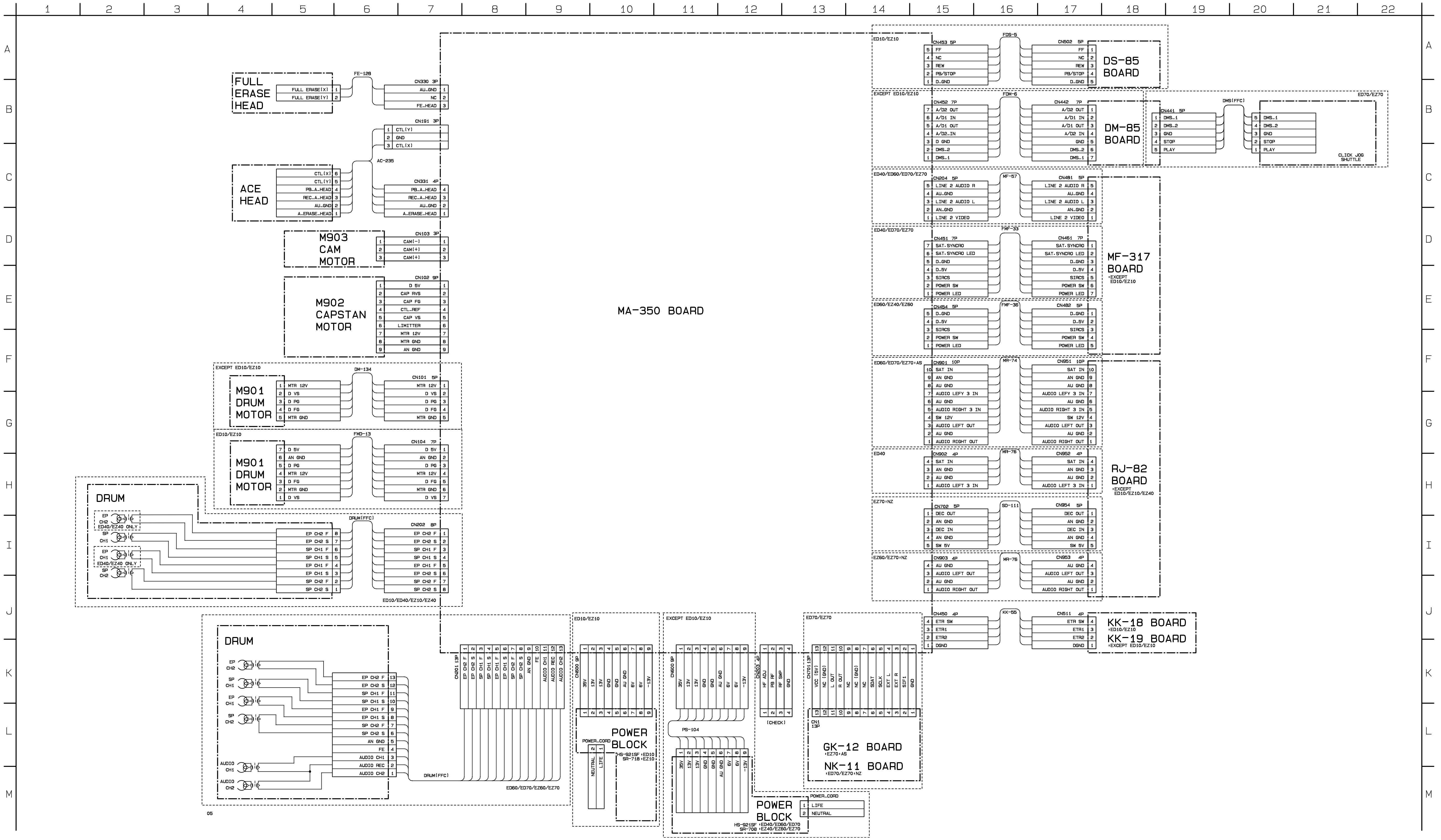
For schematic Diagram:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, $^1/_4$ W (Chip resistors : $^1/_{10}$ W) unless otherwise specified.
  kΩ : 1000Ω, MW : 1000kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- —▭— : nonflammable resistor.
- —∿∿•— : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repair.
- B + : B+ Line.
- B – : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production tolerances.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

4-1. FRAME SCHEMATIC DIAGRAM

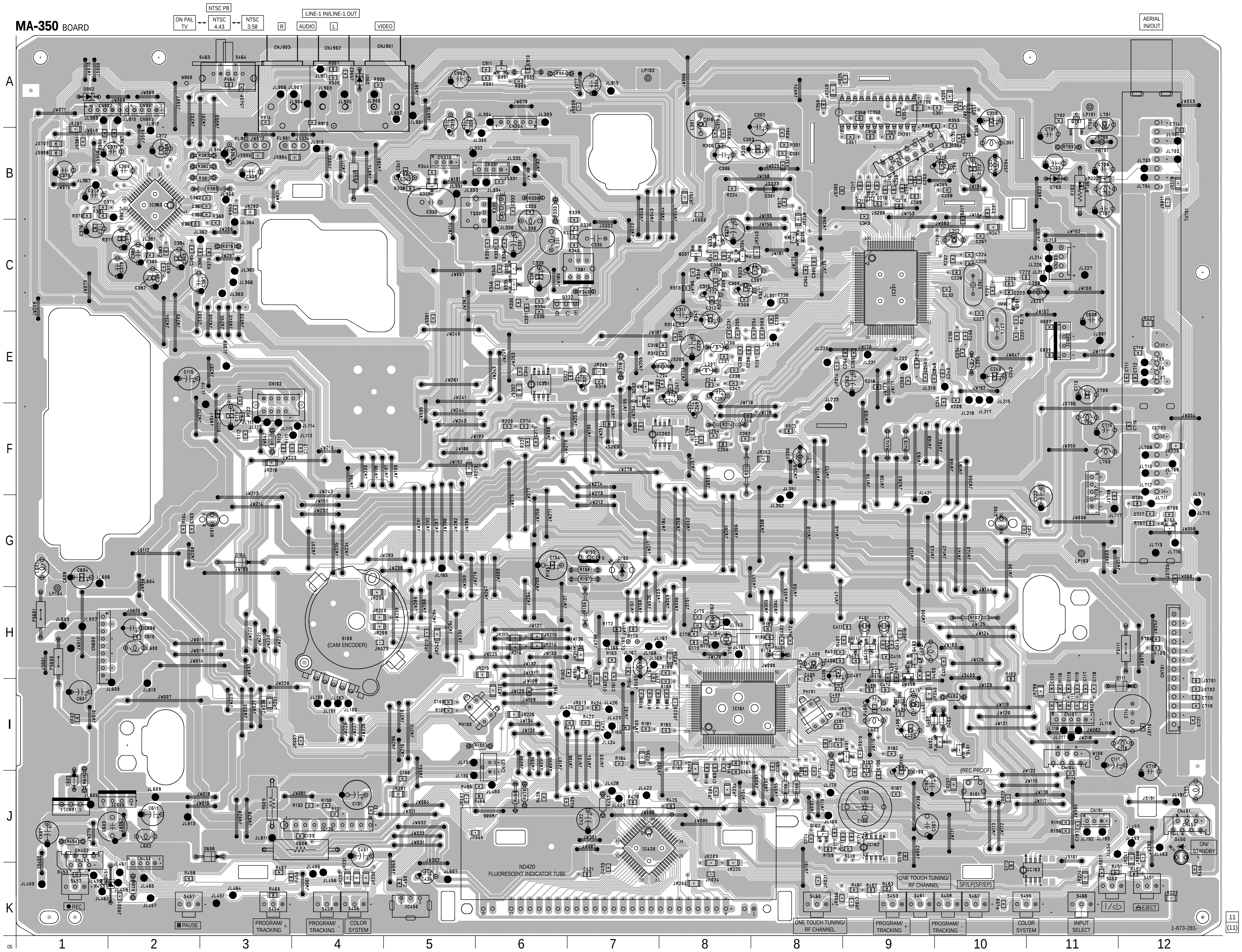

MA-350 BOARD
FULL ERASE HEAD
FE-128
CN330 3P
ACE HEAD
AC-235
CN191 3P
CN331 4P
M903 CAM MOTOR
CN103 3P
M902 CAPSTAN MOTOR
CN102 9P
EXCEPT ED10/EZ10
M901 DRUM MOTOR
DM-134
CN101 5P
ED10/EZ10
FMD-13
CN104 7P
DRUM
DRUM(FFC)
CN202 8P
ED40/EZ40 ONLY
ED10/ED40/EZ10/EZ40
CN201 13P
ED60/ED70/EZ60/EZ70
CN600 9P
POWER BLOCK
POWER_CORD
HS-921SF : ED10
SR-718 : EZ10
EXCEPT ED10/EZ10
CN600 9P
PS-104
HS-921SF : ED40/ED60/ED70
SR-708 : EZ40/EZ60/EZ70
CN602 4P
(CHECK)
ED70/EZ70
CN701 13P
CN1 13P
GK-12 BOARD
(EZ70 : AS)
NK-11 BOARD
(ED70/EZ70 : NZ)
ED10/EZ10
CN453 5P
FDS-5
CN502 5P
DS-85 BOARD
EXCEPT ED10/EZ10
CN452 7P
FDM-6
CN442 7P
DM-85 BOARD
DMS(FFC)
CN441 5P
ED70/EZ70
CLICK JOG SHUTTLE
ED40/ED60/ED70/EZ70
CN204 5P
MF-57
CN481 5P
ED40/ED70/EZ70
CN451 7P
FMF-33
CN461 7P
MF-317 BOARD
(EXCEPT ED10/EZ10)
ED60/EZ40/EZ60
CN454 5P
FMF-36
CN482 5P
ED60/ED70/EZ70 : AS
CN901 10P
MR-74
CN951 10P
ED40
CN902 4P
MR-76
CN952 4P
RJ-82 BOARD
(EXCEPT ED10/EZ10/EZ40)
EZ70 : NZ
CN702 5P
SD-111
CN954 5P
EZ60/EZ70 : NZ
CN903 4P
MR-78
CN953 4P
CN450 4P
KK-58
CN511 4P
KK-18 BOARD
(ED10/EZ10)
KK-19 BOARD
(EXCEPT ED10/EZ10)
05

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

MA-350 (VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER) PRINTED WIRING BOARD

– Ref. No.: MA-350 board; 1,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

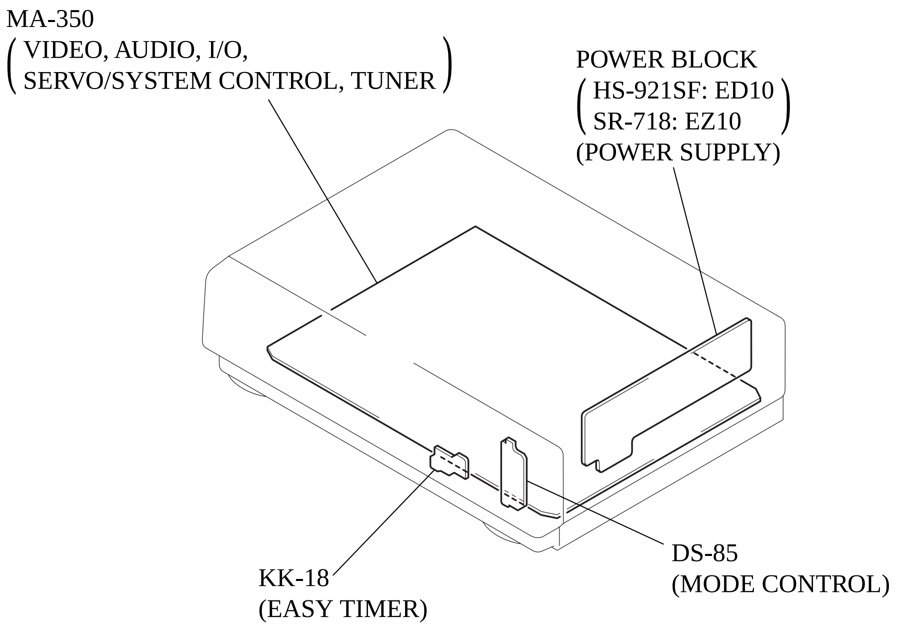

MA-350 BOARD
NTSC PB
ON PAL TV
NTSC 4.43
NTSC 3.58
LINE-1 IN/LINE-1 OUT
R
AUDIO
L
VIDEO
AERIAL IN/OUT
A
B
C
E
F
G
H
I
J
K
S100 (CAM ENCODER)
ND420 FLUORESCENT INDICATOR TUBE
IC161
IC201
(REC PROOF)
REC
PAUSE
PROGRAM/ TRACKING
COLOR SYSTEM
ONE TOUCH TUNING/ RF CHANNEL
SP/LP(SP/EP)
INPUT SELECT
EJECT
ON/ STANDBY
1-673-281-
11 (11)
1
2
3
4
5
6
7
8
8
9
10
11
12

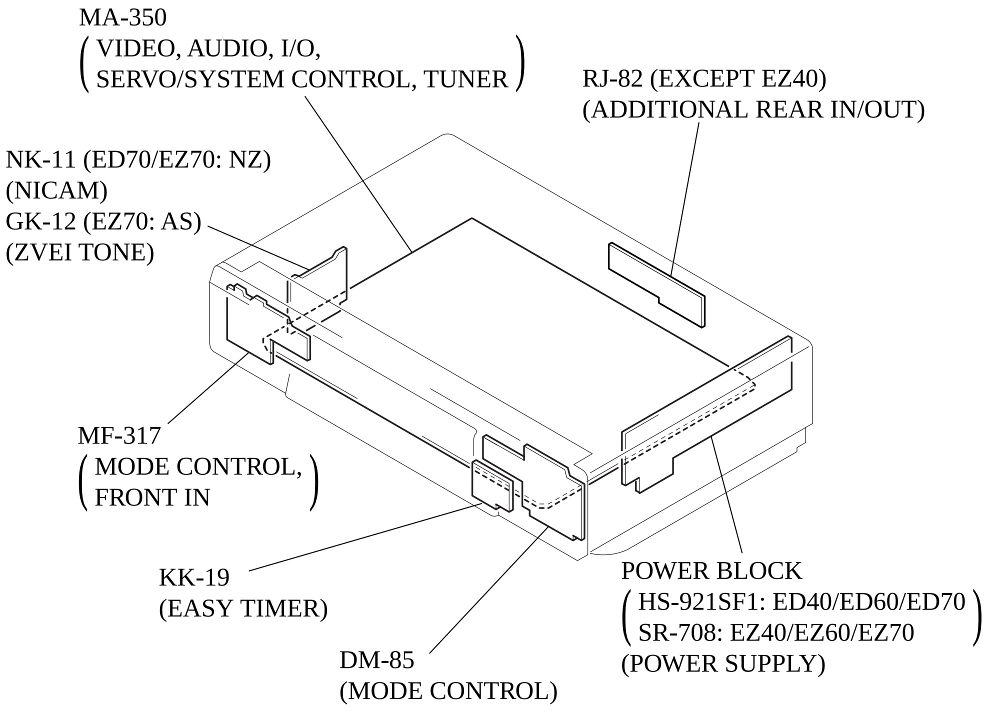
VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER

MA-350

MA-350 BOARD

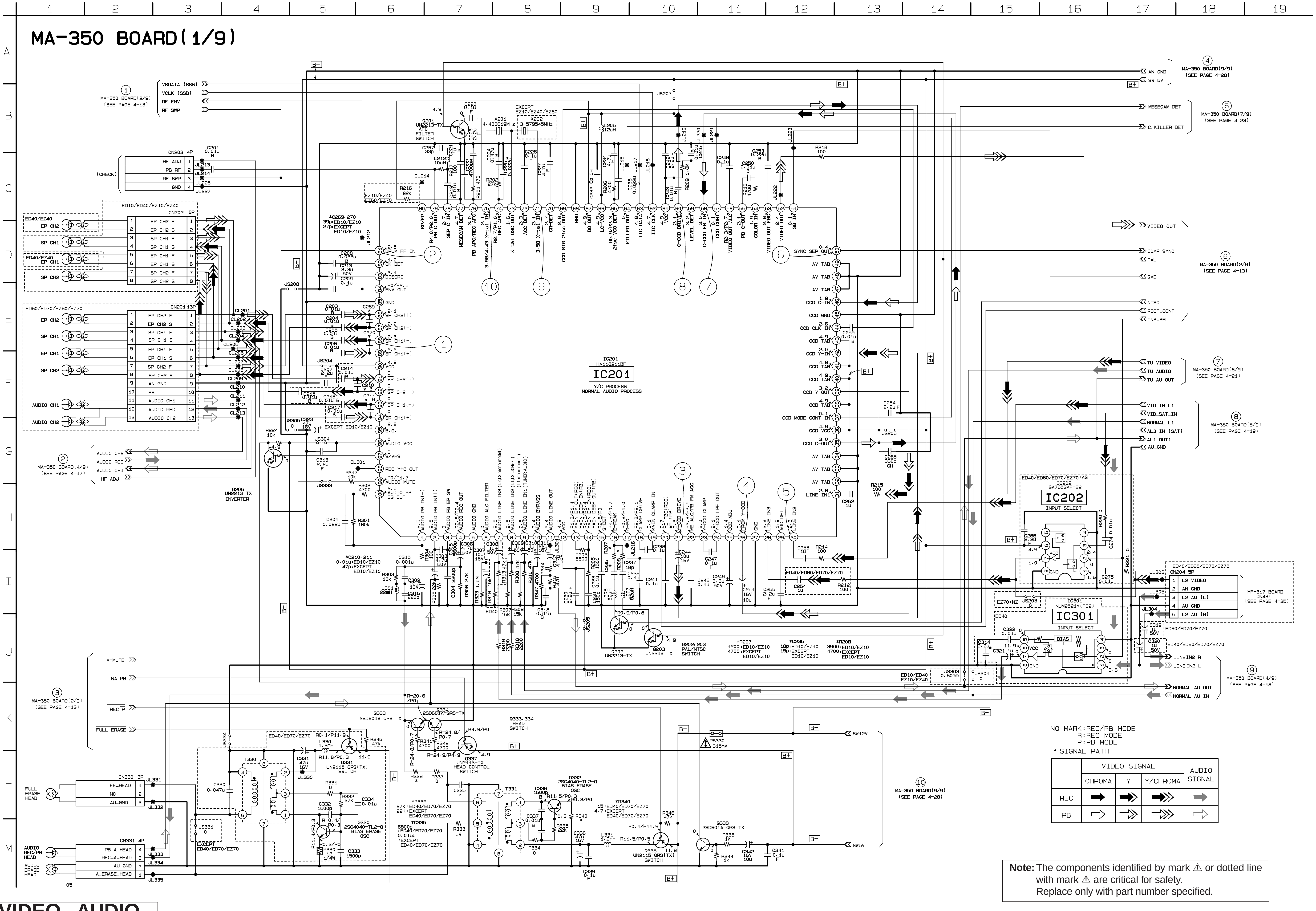
CN101	H-12
CN102	D-3
CN103	H-6
CN104	H-12
CN191	I-12
CN201	B-10
CN202	B-10
CN203	C-12
CN204	A-6
CN330	B-5
CN331	B-6
CN450	I-2
CN451	I-13
CN452	I-1
CN453	I-1
CN454	I-13
CN600	G-1
CN701	G-13
CN702	E-12
CN901	A-2
CN902	A-1
CN903	A-2
D102	F-7
D111	H-13
D164	F-3
D401	G-9
D402	H-11
D403	H-10
D450	I-13
D603	I-1
D606	I-3
D703	B-12
IC130	I-4
IC161	H-8
IC162	I-10
IC163	J-12
IC201	C-10
IC202	E-8
IC301	D-6
IC350	A-10
IC360	B-2
IC420	I-7
IC450	I-2
IC600	I-2
IC601	I-1
IC602	D-12
Q100	F-11
Q101	F-3
Q102	F-7
Q161	G-7
Q191	H-10
Q201	C-11
Q202	D-7
Q203	D-7
Q206	C-9
Q330	B-6
Q331	C-6
Q332	C-6
Q333	C-8
Q334	C-8
Q335	C-6
Q337	C-8
Q338	B-5
Q400	G-10
Q401	H-11
Q402	H-11
Q403	G-10
Q410	H-10
Q701	H-12
Q702	F-13
Q901	A-6


MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
POWER BLOCK
(HS-921SF: ED10
SR-718: EZ10)
(POWER SUPPLY)
KK-18
(EASY TIMER)
DS-85
(MODE CONTROL)


MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL,
FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)

MA-350 (VIDEO, AUDIO) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


MA-350 BOARD(1/9)
IC201
HA118211BF
Y/C PROCESS
NORMAL AUDIO PROCESS
IC202
BA7653AF-E2
INPUT SELECT
IC301
NJM2521M(TE2)
INPUT SELECT
MA-350 BOARD(2/9) (SEE PAGE 4-13)
MA-350 BOARD(4/9) (SEE PAGE 4-17)
MA-350 BOARD(9/9) (SEE PAGE 4-28)
MA-350 BOARD(7/9) (SEE PAGE 4-23)
MA-350 BOARD(6/9) (SEE PAGE 4-21)
MA-350 BOARD(5/9) (SEE PAGE 4-19)
MA-350 BOARD(4/9) (SEE PAGE 4-18)
MF-317 BOARD CN481 (SEE PAGE 4-35)
CN203 4P
CN202 8P
CN201 13P
CN204 5P
CN330 3P
CN331 4P
FULL ERASE HEAD
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
Q206 UN2213-TX INVERTER
Q201 UN2213-TX AFC FILTER SWITCH
Q202, 203 PAL/NTSC SWITCH
Q333, 334 HEAD SWITCH
Q331 UN2115-QRS(TX) SWITCH
Q337 UN2113-TX HEAD CONTROL SWITCH
Q330 2SC4040-TL2-Q BIAS ERASE OSC
Q332 2SC4040-TL2-Q BIAS ERASE OSC
Q335 UN2115-QRS(TX) SWITCH
Q338 2SD601A-QRS-TX
PS330 315mA
VIDEO OUT
COMP SYNC
TU VIDEO
TU AUDIO
TU AU OUT
VID IN L1
NORMAL AU OUT
NORMAL AU IN
SW12V
SW5V
A-MUTE
NA PB
REC P
FULL ERASE

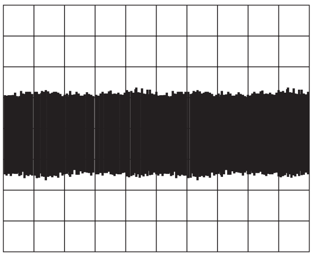
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	➡
PB	⇨	⇨⇨	⇨⇨⇨	⇨

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

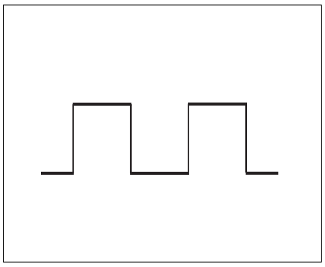
- **Waveforms**

❶ IC201 (88) REC



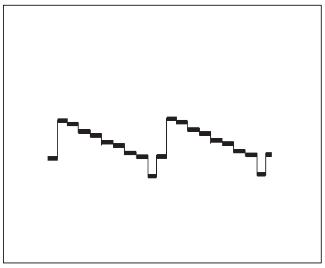
1.4 Vp-p (2V)

❷ IC201 (81) REC/PB



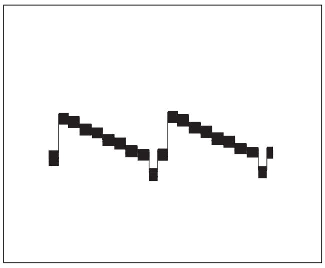
5.2 Vp-p (2 V)

❸ IC201 ㉑ REC/PB



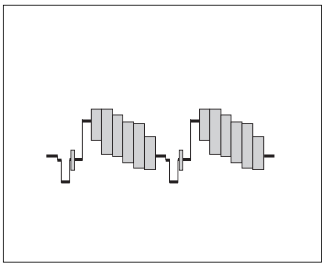
REC : 360 mVp-p (H)
PB : 456 mVp-p (H)

❹ IC201 ㉖ REC/PB



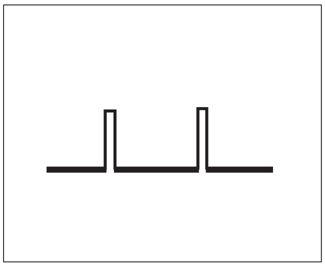
REC : 528 mVp-p (H)
PB : 624 mVp-p (H)

❺ IC201 ㉚ REC



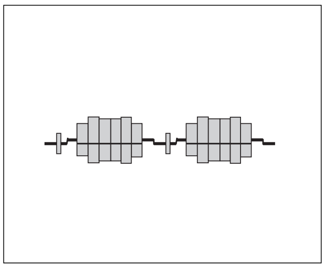
1.1 Vp-p (H)

❻ IC201 ㊿ REC/PB



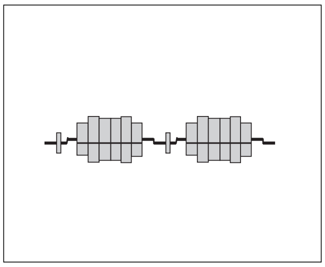
5.4 Vp-p (H)

❼ IC201 (58) REC/PB



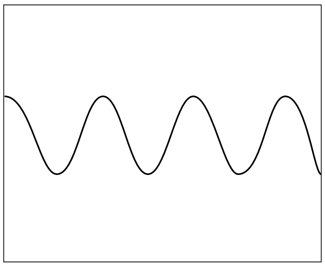
REC : 512 mVp-p (H)
PB : 608 mVp-p (H)

❽ IC201 (60) REC/PB



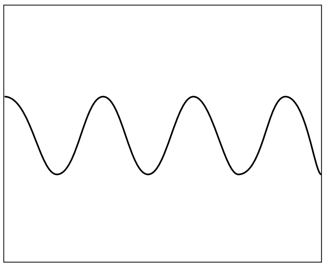
REC : 352 mVp-p (H)
PB : 552 mVp-p (H)

❾ IC201 (71) REC/PB



120 mVp-p (3.579545 MHz)

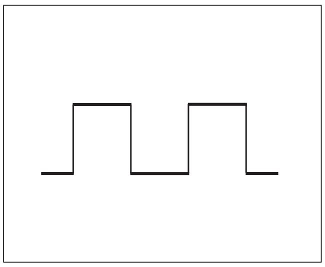
❿ IC201 (75) REC/PB



552 mVp-p (4.433619 MHz)

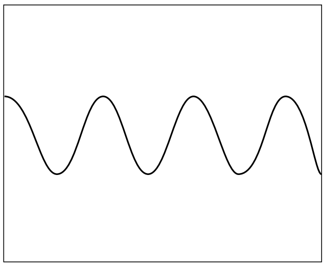
- **Waveforms**

❶ IC161 ㉔ REC/PB



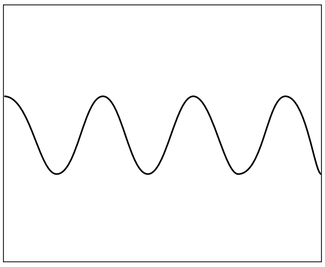
5.3 Vp-p (2V)

❷ IC161 (70) REC/PB



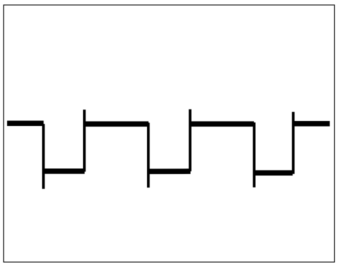
2.1 Vp-p (32.768 kHz)

❸ IC161 (73) REC/PB



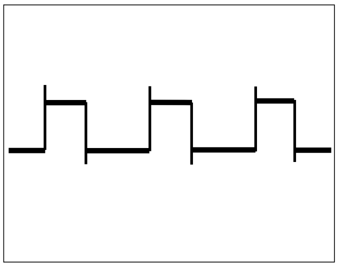
3.5 Vp-p (10 MHz)

❹ IC161 ㉛ REC



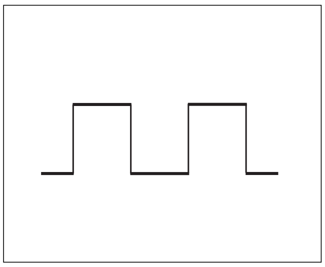
5.6 Vp-p (2 V)

❺ IC161 ㉜ REC



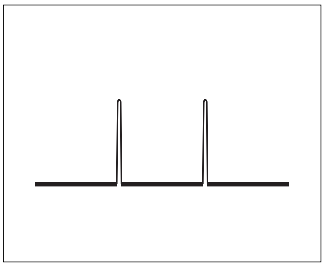
5.6 Vp-p (2 V)

❻ IC161 ㊳ REC/PB



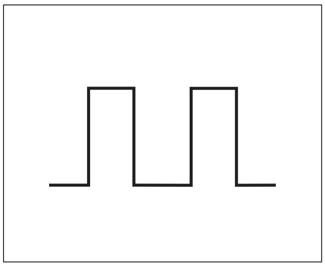
4.4 Vp-p (2 V)

❼ IC161 ㊴ REC/PB



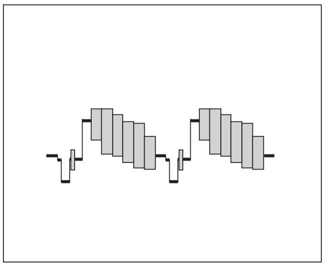
4.7 Vp-p (2 V)

❽ IC161 ㊵ REC/PB



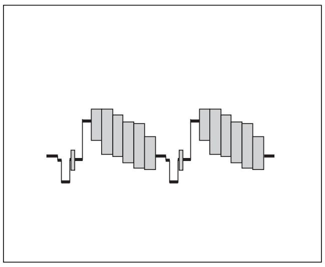
4.9 Vp-p (2 V)

❾ IC161 ㊸ REC/PB



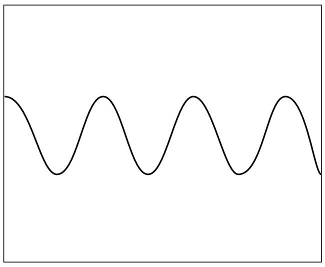
1.8 Vp-p (H)

❿ IC161 ㊺ REC/PB



1.8 Vp-p (H)

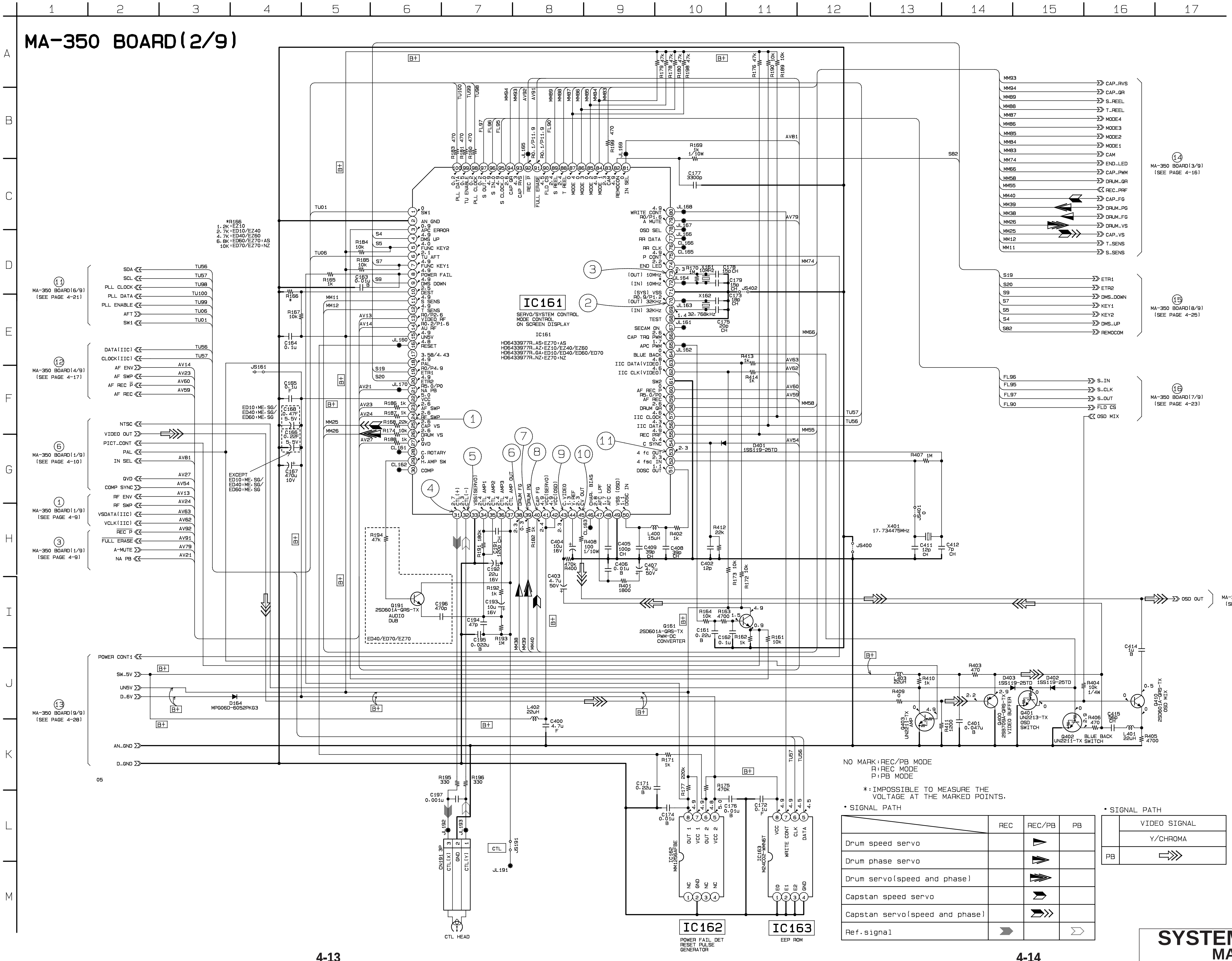
⓫ IC161 (53) REC/PB



3.4 Vp-p (17.734475 MHz)

MA-350 (SYSTEM CONTROL) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


MA-350 BOARD(2/9)
IC161
SERVO/SYSTEM CONTROL
MODE CONTROL
ON SCREEN DISPLAY
IC161
HD6433977R_AS:EZ70:AS
HD6433977R_AZ:EZ10/EZ40/EZ60
HD6433977R_GA:ED10/ED40/ED60/ED70
HD6433977R_NZ:EZ70:NZ
*R166
1.2K:EZ10
2.7K:ED10/EZ40
4.7K:ED40/EZ60
6.8K:ED60/EZ70:AS
10K:ED70/EZ70:NZ
11 MA-350 BOARD(6/9) (SEE PAGE 4-21)
SDA
SCL
PLL CLOCK
PLL DATA
PLL ENABLE
AFT
SW1
12 MA-350 BOARD(4/9) (SEE PAGE 4-17)
DATA(IIC)
CLOCK(IIC)
AF ENV
AF SWP
AF REC P
AF REC
6 MA-350 BOARD(1/9) (SEE PAGE 4-10)
NTSC
VIDEO OUT
PICT_CONT
PAL
IN SEL
QVD
COMP SYNC
1 MA-350 BOARD(1/9) (SEE PAGE 4-9)
RF ENV
RF SWP
VSDATA(IIC)
VCLK(IIC)
3 MA-350 BOARD(1/9) (SEE PAGE 4-9)
REC P
FULL ERASE
A-MUTE
NA PB
13 MA-350 BOARD(9/9) (SEE PAGE 4-28)
POWER CONT1
SW_5V
UN5V
D_6V
AN_GND
D_GND
D164 MPG06D-6052PKG3
EXCEPT ED10:ME,SG/ ED40:ME,SG/ ED60:ME,SG
ED10:ME,SG/ ED40:ME,SG/ ED60:ME,SG
14 MA-350 BOARD(3/9) (SEE PAGE 4-16)
CAP_RVS
CAP_QR
S_REEL
T_REEL
MODE4
MODE3
MODE2
MODE1
CAM
END_LED
CAP_PWM
DRUM_QR
REC_PRF
CAP_FG
DRUM_PG
DRUM_FG
DRUM_VS
CAP_VS
T_SENS
S_SENS
15 MA-350 BOARD(8/9) (SEE PAGE 4-25)
ETR1
ETR2
DMS_DOWN
KEY1
KEY2
DMS_UP
REMOCOM
16 MA-350 BOARD(7/9) (SEE PAGE 4-23)
S_IN
S_CLK
S_OUT
FLD CS
OSD MIX
17 MA-350 BOARD(5/9) (SEE PAGE 4-19)
OSD OUT
Q191 2SD601A-QRS-TX AUDIO DUB
ED40/ED70/EZ70
Q161 2SD601A-QRS-TX PWM-DC CONVERTER
X401 17.734475MHz
Q403 UN2211-TX AMP
Q400 2SB709A-QRS-TX VIDEO BUFFER
Q401 UN2213-TX OSD SWITCH
Q402 UN2211-TX BLUE BACK SWITCH
Q410 2SD601A-QRS-TX OSD MIX
D403 1SS119-25TD
D402 1SS119-25TD
D401 1SS119-25TD
CN191 3P
CTL HEAD
JL191
IC162 MM1256AFBE
IC162
POWER FAIL DET
RESET PULSE
GENERATOR
IC163 M24C02-WMN6T
IC163
EEP ROM
05

NO MARK:REC/PB MODE
R:REC MODE
P:PB MODE

*:IMPOSSIBLE TO MEASURE THE
VOLTAGE AT THE MARKED POINTS.

• SIGNAL PATH

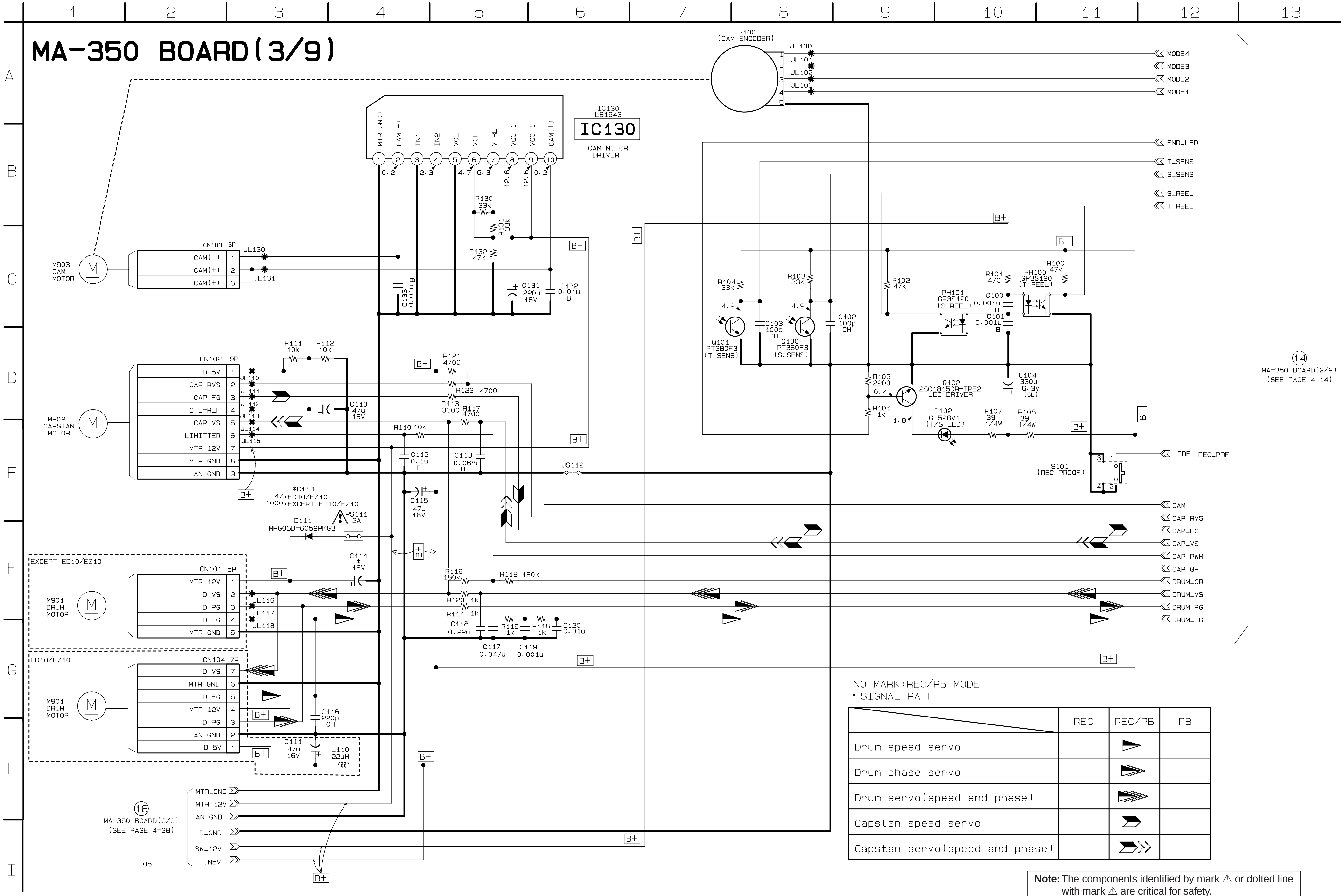
	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		⋙	
Drum servo(speed and phase)		⋙	
Capstan speed servo		➤	
Capstan servo(speed and phase)		➤⟫	
Ref.signal	➡		⇨

• SIGNAL PATH

	VIDEO SIGNAL
	Y/CHROMA
PB	⇨⟫

MA-350 (SERVO CONTROL) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


1 2 3 4 5 6 7 8 9 10 11 12 13
A B C D E F G H I
MA-350 BOARD(3/9)
S100 (CAM ENCODER)
JL100 JL101 JL102 JL103
MODE4
MODE3
MODE2
MODE1
IC130 LB1943
IC130
CAM MOTOR DRIVER
MTR(GND) CAM(-) IN1 IN2 VCL VCH V REF VCC 1 VCC 1 CAM(+)
END_LED
T_SENS
S_SENS
S_REEL
T_REEL
M903 CAM MOTOR
CN103 3P
CAM(-) CAM(+) CAM(+)
JL130 JL131
R130 33k
R131 33k
R132 47k
C131 220u 16V
C132 0.01u B
C133 0.01u B
R104 33k
R103 33k
R102 47k
R101 470
R100 47k
PH100 GP3S120 (T REEL)
PH101 GP3S120 (S REEL)
C100 0.001u B
C101 0.001u B
C103 100p CH
C102 100p CH
Q101 PT380F3 (T SENS)
Q100 PT380F3 (SUSENS)
M902 CAPSTAN MOTOR
CN102 9P
D 5V CAP RVS CAP FG CTL-REF CAP VS LIMITTER MTR 12V MTR GND AN GND
JL110 JL111 JL112 JL113 JL114 JL115
R111 10k
R112 10k
R121 4700
R122 4700
R113 3300
R117 4700
R110 10k
C110 47u 16V
C112 0.1u F
C113 0.068u B
R105 2200
R106 1k
Q102 2SC1815GR-TPE2 LED DRIVER
D102 GL528V1 (T/S LED)
R107 39 1/4W
R108 39 1/4W
C104 330u 6.3V (SL)
⑭ MA-350 BOARD(2/9) (SEE PAGE 4-14)
S101 (REC PROOF)
PRF REC_PRF
JS112
*C114 47:ED10/EZ10 1000:EXCEPT ED10/EZ10
D111 MPG06D-6052PKG3
PS111 2A
C115 47u 16V
C114 * 16V
CAM
CAP_RVS
CAP_FG
CAP_VS
CAP_PWM
CAP_QR
DRUM_QR
DRUM_VS
DRUM_PG
DRUM_FG
EXCEPT ED10/EZ10
M901 DRUM MOTOR
CN101 5P
MTR 12V D VS D PG D FG MTR GND
JL116 JL117 JL118
R116 180k
R119 180k
R120 1k
R114 1k
C118 0.22u
R115 1k
R118 1k
C120 0.01u
C117 0.047u
C119 0.001u
ED10/EZ10
CN104 7P
D VS MTR GND D FG MTR 12V D PG AN GND D 5V
C116 220p CH
C111 47u 16V
L110 22uH
B+
⑱ MA-350 BOARD(9/9) (SEE PAGE 4-28)
MTR_GND MTR_12V AN_GND D_GND SW_12V UN5V
05

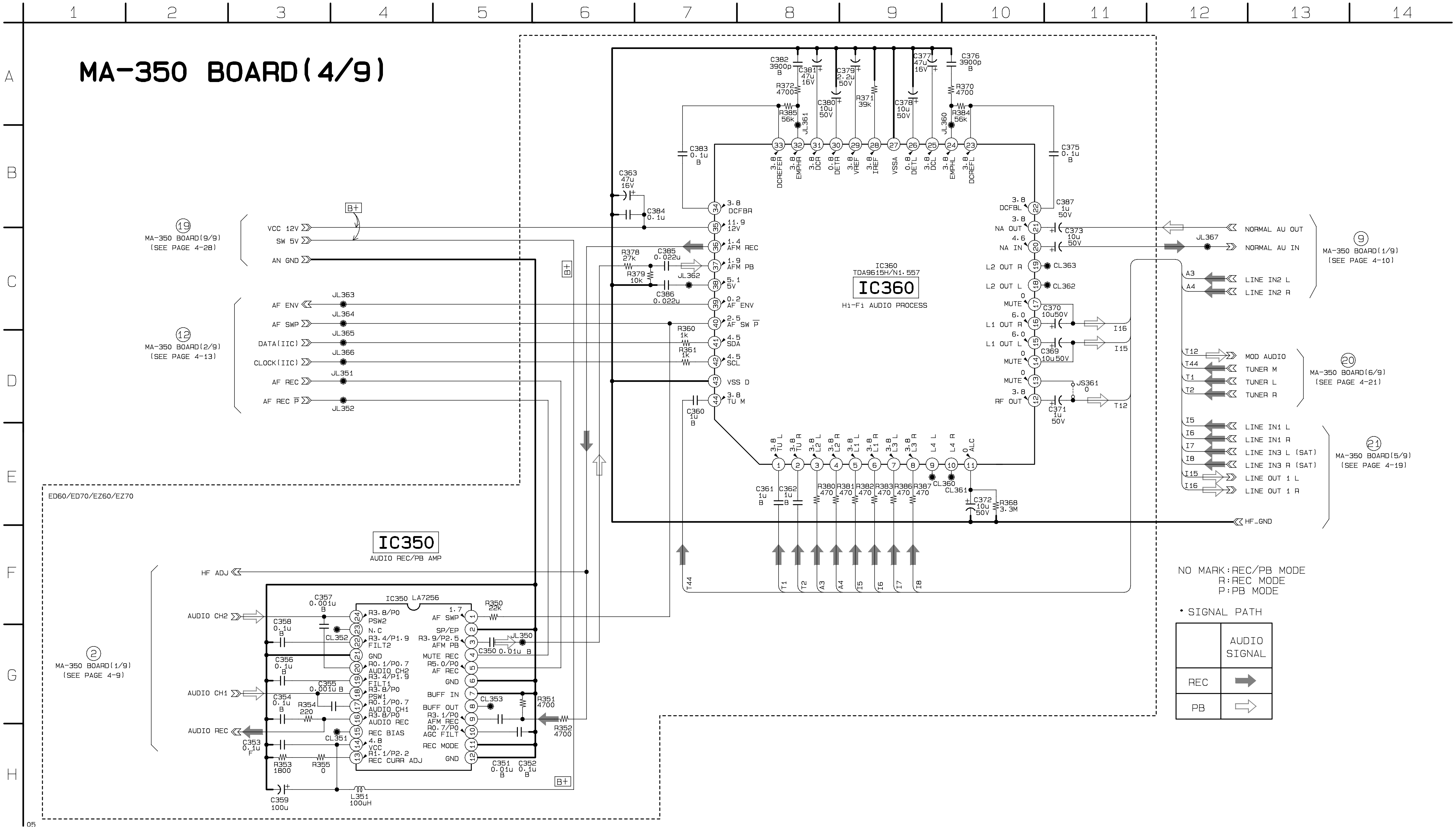
NO MARK:REC/PB MODE
• SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		⇛	
Drum servo(speed and phase)		⇶	
Capstan speed servo		➡	
Capstan servo(speed and phase)		➡≫	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-350 (Hi-Fi AUDIO) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


MA-350 BOARD(4/9)
1 2 3 4 5 6 7 8 9 10 11 12 13 14
A B C D E F G H
IC360
TDA9615H/N1.557
Hi-Fi AUDIO PROCESS
IC350
AUDIO REC/PB AMP
IC350 LA7256
ED60/ED70/EZ60/EZ70
⑲ MA-350 BOARD(9/9) (SEE PAGE 4-28)
VCC 12V
SW 5V
AN GND
⑫ MA-350 BOARD(2/9) (SEE PAGE 4-13)
AF ENV
AF SWP
DATA(IIC)
CLOCK(IIC)
AF REC
AF REC P
JL363
JL364
JL365
JL366
JL351
JL352
② MA-350 BOARD(1/9) (SEE PAGE 4-9)
HF ADJ
AUDIO CH2
AUDIO CH1
AUDIO REC
⑨ MA-350 BOARD(1/9) (SEE PAGE 4-10)
NORMAL AU OUT
NORMAL AU IN
LINE IN2 L
LINE IN2 R
⑳ MA-350 BOARD(6/9) (SEE PAGE 4-21)
MOD AUDIO
TUNER M
TUNER L
TUNER R
㉑ MA-350 BOARD(5/9) (SEE PAGE 4-19)
LINE IN1 L
LINE IN1 R
LINE IN3 L (SAT)
LINE IN3 R (SAT)
LINE OUT 1 L
LINE OUT 1 R
HF_GND
B+
C382 3900p B
C381 47u 16V
C379 2.2u 50V
C377 47u 16V
C376 3900p B
R372 4700
R370 4700
C380 10u 50V
R371 39k
C378 10u 50V
R385 56k
R384 56k
JL361
JL360
C383 0.1u B
C375 0.1u B
C363 47u 16V
C384 0.1u
R378 27k
C385 0.022u
R379 10k
C386 0.022u
JL362
R360 1k
R361 1k
C360 1U B
C387 1u 50V
C373 10u 50V
JL367
CL363
CL362
C370 10u50V
C369 10u50V
JS361
C371 1u 50V
I16 I15 I12
A3 A4 T12 T44 T1 T2 I5 I6 I7 I8 I15 I16
C361 1u B
C362 1u B
R380 470
R381 470
R382 470
R383 470
R386 470
R387 470
CL360
CL361
C372 10u 50V
R368 3.3M
T44 T1 T2 A3 A4 I5 I6 I7 I8
3.8 DCFBR
11.9 12V
1.4 AFM REC
1.9 AFM PB
5.1 5V
0.2 AF ENV
2.5 AF SW P
4.5 SDA
4.5 SCL
VSS D
3.8 TU M
3.8 DCFBL
3.8 NA OUT
4.6 NA IN
L2 OUT R
L2 OUT L
0 MUTE
6.0 L1 OUT R
6.0 L1 OUT L
0 MUTE
0 MUTE
3.8 RF OUT
3.8 DCREFR
3.8 EMPHR
3.8 DCR
0.8 DETR
3.8 VREF
3.8 IREF
VSSA
0.8 DETL
3.8 DCL
3.8 EMPHL
3.8 DCREFL
3.8 TU L
3.8 TU R
3.8 L2 L
3.8 L2 R
3.8 L1 L
3.8 L1 R
3.8 L3 L
3.8 L3 R
L4 L
L4 R
0 ALC
C357 0.001u B
C358 0.1u B
CL352
C356 0.1u B
C355 0.001u B
C354 0.1u B
R354 220
CL351
C353 0.1u F
R353 1800
R355 0
C359 100u
L351 100uH
R350 22k
JL350
C350 0.01u B
CL353
R351 4700
R352 4700
C351 0.01u B
C352 0.1u B
R3.8/P0 PSW2
N.C
R3.4/P1.9 FILT2
GND
R0.1/P0.7 AUDIO CH2
R3.4/P1.9 FILT1
R3.8/P0 PSW1
R0.1/P0.7 AUDIO CH1
R3.8/P0 AUDIO REC
REC BIAS
4.8 VCC
R1.1/P2.2 REC CURR ADJ
1.7 AF SWP
SP/EP
R3.9/P2.5 AFM PB
MUTE REC
R5.0/P0 AF REC
GND
BUFF IN
BUFF OUT
R3.1/P0 AFM REC
R0.7/P0 AGC FILT
REC MODE
GND
05

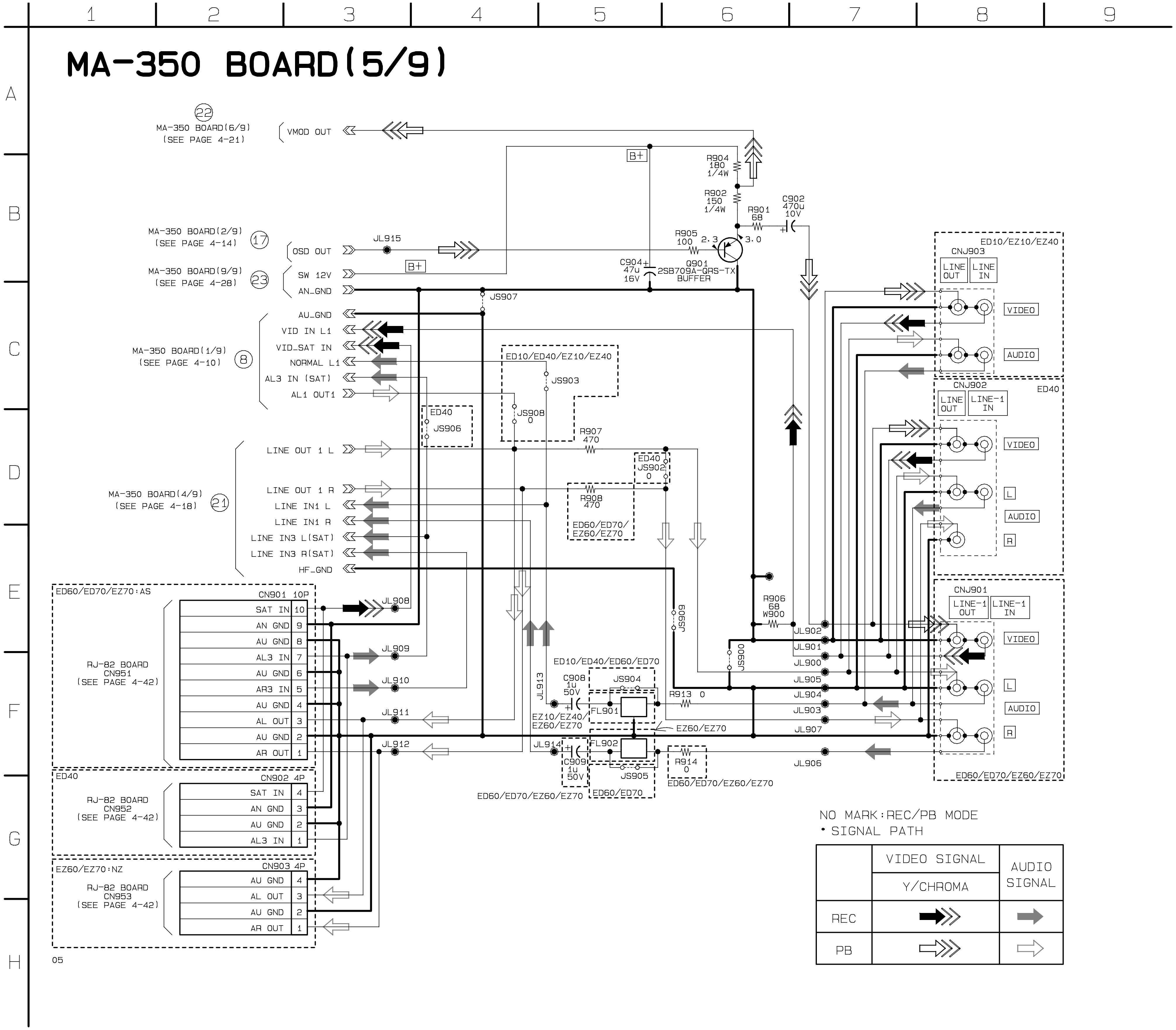
NO MARK : REC/PB MODE
R : REC MODE
P : PB MODE

• SIGNAL PATH

	AUDIO SIGNAL
REC	➡
PB	⇨

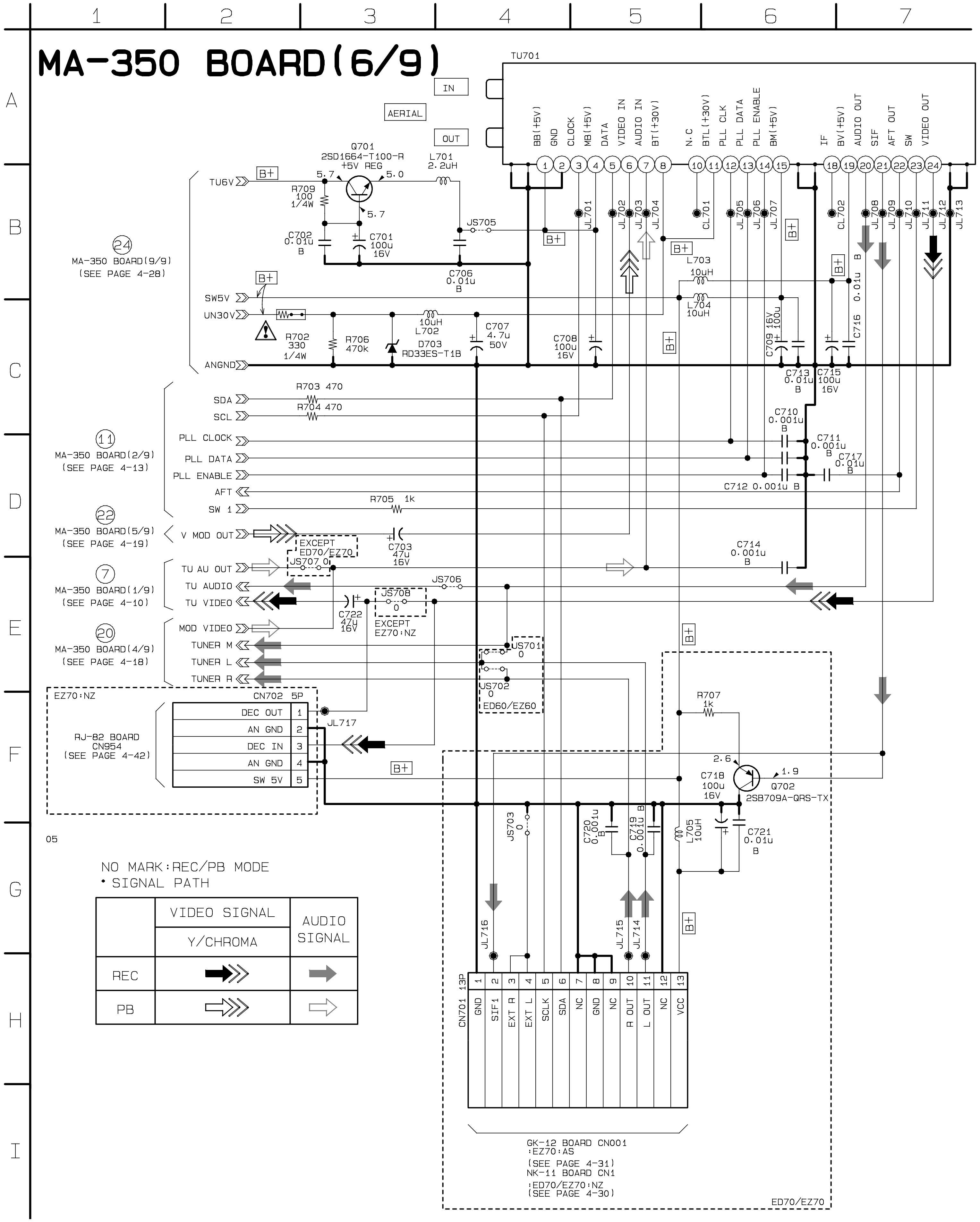
MA-350 (I/O) SCHEMATIC DIAGRAM **• See page 4-5 for printed wiring board.**

– Ref. No.: MA-350 board; 1,000 series –


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
MA-350 BOARD(5/9)
22
MA-350 BOARD(6/9) (SEE PAGE 4-21)
VMOD OUT
B+
R904 180 1/4W
R902 150 1/4W
R901 68
C902 470u 10V
R905 100
2.3
3.0
Q901 2SB709A-QRS-TX BUFFER
C904 47u 16V
MA-350 BOARD(2/9) (SEE PAGE 4-14)
17
OSD OUT
JL915
MA-350 BOARD(9/9) (SEE PAGE 4-28)
23
SW 12V
AN_GND
JS907
AU_GND
MA-350 BOARD(1/9) (SEE PAGE 4-10)
8
VID IN L1
VID_SAT IN
NORMAL L1
AL3 IN (SAT)
AL1 OUT1
ED10/ED40/EZ10/EZ40
JS903
ED40
JS906
JS908 0
R907 470
ED40 JS902 0
LINE OUT 1 L
MA-350 BOARD(4/9) (SEE PAGE 4-18)
21
LINE OUT 1 R
LINE IN1 L
LINE IN1 R
LINE IN3 L(SAT)
LINE IN3 R(SAT)
HF_GND
R908 470
ED60/ED70/EZ60/EZ70
ED10/EZ10/EZ40
CNJ903
LINE OUT
LINE IN
VIDEO
AUDIO
CNJ902
ED40
LINE OUT
LINE-1 IN
VIDEO
L
AUDIO
R
ED60/ED70/EZ70:AS
CN901 10P
SAT IN 10
AN GND 9
AU GND 8
AL3 IN 7
AU GND 6
AR3 IN 5
AU GND 4
AL OUT 3
AU GND 2
AR OUT 1
RJ-82 BOARD CN951 (SEE PAGE 4-42)
JL908
JL909
JL910
JL911
JL912
JS909
R906 68
W900
JS900
JL902
JL901
JL900
JL905
JL904
JL903
JL907
JL906
CNJ901
LINE-1 OUT
LINE-1 IN
VIDEO
L
AUDIO
R
ED60/ED70/EZ60/EZ70
ED10/ED40/ED60/ED70
JL913
C908 1u 50V
JS904
FL901
R913 0
EZ10/EZ40/EZ60/EZ70
EZ60/EZ70
JL914
FL902
C909 1u 50V
JS905
R914 0
ED60/ED70/EZ60/EZ70
ED60/ED70
ED60/ED70/EZ60/EZ70
ED40
CN902 4P
SAT IN 4
AN GND 3
AU GND 2
AL3 IN 1
RJ-82 BOARD CN952 (SEE PAGE 4-42)
EZ60/EZ70:NZ
CN903 4P
AU GND 4
AL OUT 3
AU GND 2
AR OUT 1
RJ-82 BOARD CN953 (SEE PAGE 4-42)
05
NO MARK:REC/PB MODE
• SIGNAL PATH
VIDEO SIGNAL
Y/CHROMA
AUDIO SIGNAL
REC
PB

MA-350 (TUNER) SCHEMATIC DIAGRAM **• See page 4-5 for printed wiring board.**

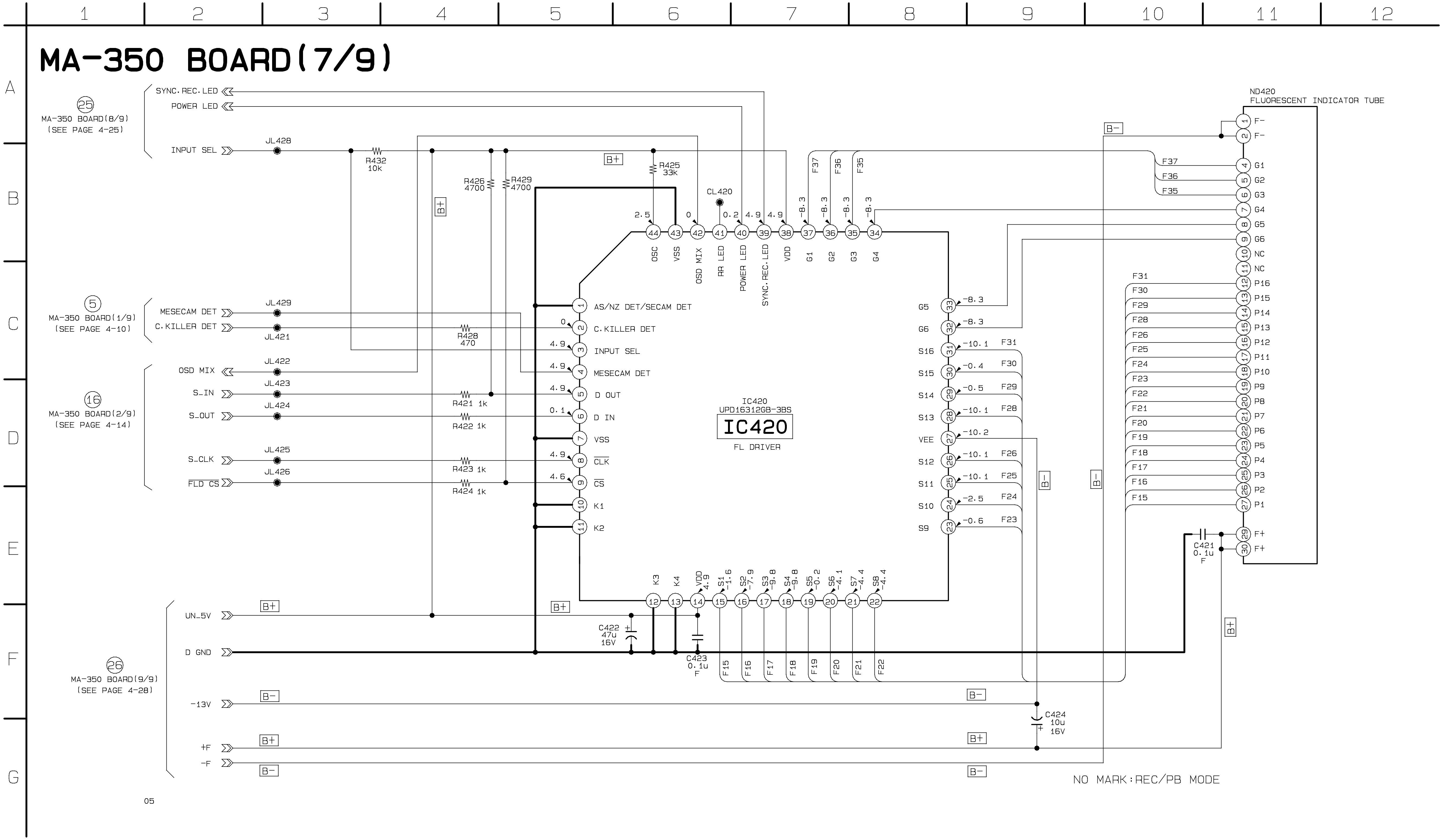
– Ref. No.: MA-350 board; 1,000 series –


MA-350 BOARD(6/9)
TU701
IN
AERIAL
OUT
BB(+5V) GND CLOCK MB(+5V) DATA VIDEO IN AUDIO IN BT(+30V) N.C BTL(+30V) PLL CLK PLL DATA PLL ENABLE BM(+5V) IF BV(+5V) AUDIO OUT SIF AFT OUT SW VIDEO OUT
Q701 2SD1664-T100-R +5V REG
L701 2.2uH
TU6V
R709 100 1/4W
C702 0.01u B
C701 100u 16V
JS705
C706 0.01u B
24 MA-350 BOARD(9/9) (SEE PAGE 4-28)
SW5V
UN30V
ANGND
R702 330 1/4W
R706 470k
L702 10uH
D703 RD33ES-T1B
C707 4.7u 50V
C708 100u 16V
L703 10uH
L704 10uH
C709 16V 100u
C716 0.01u B
C713 0.01u B
C715 100u 16V
SDA
SCL
R703 470
R704 470
11 MA-350 BOARD(2/9) (SEE PAGE 4-13)
PLL CLOCK
PLL DATA
PLL ENABLE
AFT
SW 1
C710 0.001u B
C711 0.001u B
C717 0.01u B
C712 0.001u B
R705 1k
22 MA-350 BOARD(5/9) (SEE PAGE 4-19)
V MOD OUT
EXCEPT ED70/EZ70
JS707 0
C703 47u 16V
C714 0.001u B
7 MA-350 BOARD(1/9) (SEE PAGE 4-10)
TU AU OUT
TU AUDIO
TU VIDEO
JS706
C722 47u 16V
JS708 0
EXCEPT EZ70:NZ
20 MA-350 BOARD(4/9) (SEE PAGE 4-18)
MOD VIDEO
TUNER M
TUNER L
TUNER R
JS701 0
JS702 0
ED60/EZ60
EZ70:NZ
CN702 5P
DEC OUT
AN GND
DEC IN
AN GND
SW 5V
RJ-82 BOARD CN954 (SEE PAGE 4-42)
JL717
R707 1k
C718 100u 16V
Q702 2SB709A-QRS-TX
JS703 0
C720 0.001u B
C719 0.001u B
L705 10uH
C721 0.01u B
05
CN701 13P
GND SIF1 EXT R EXT L SCLK SDA NC GND NC R OUT L OUT NC VCC
GK-12 BOARD CN001 :EZ70:AS (SEE PAGE 4-31)
NK-11 BOARD CN1 :ED70/EZ70:NZ (SEE PAGE 4-30)
ED70/EZ70
NO MARK:REC/PB MODE
• SIGNAL PATH
VIDEO SIGNAL
Y/CHROMA
AUDIO SIGNAL
REC
PB

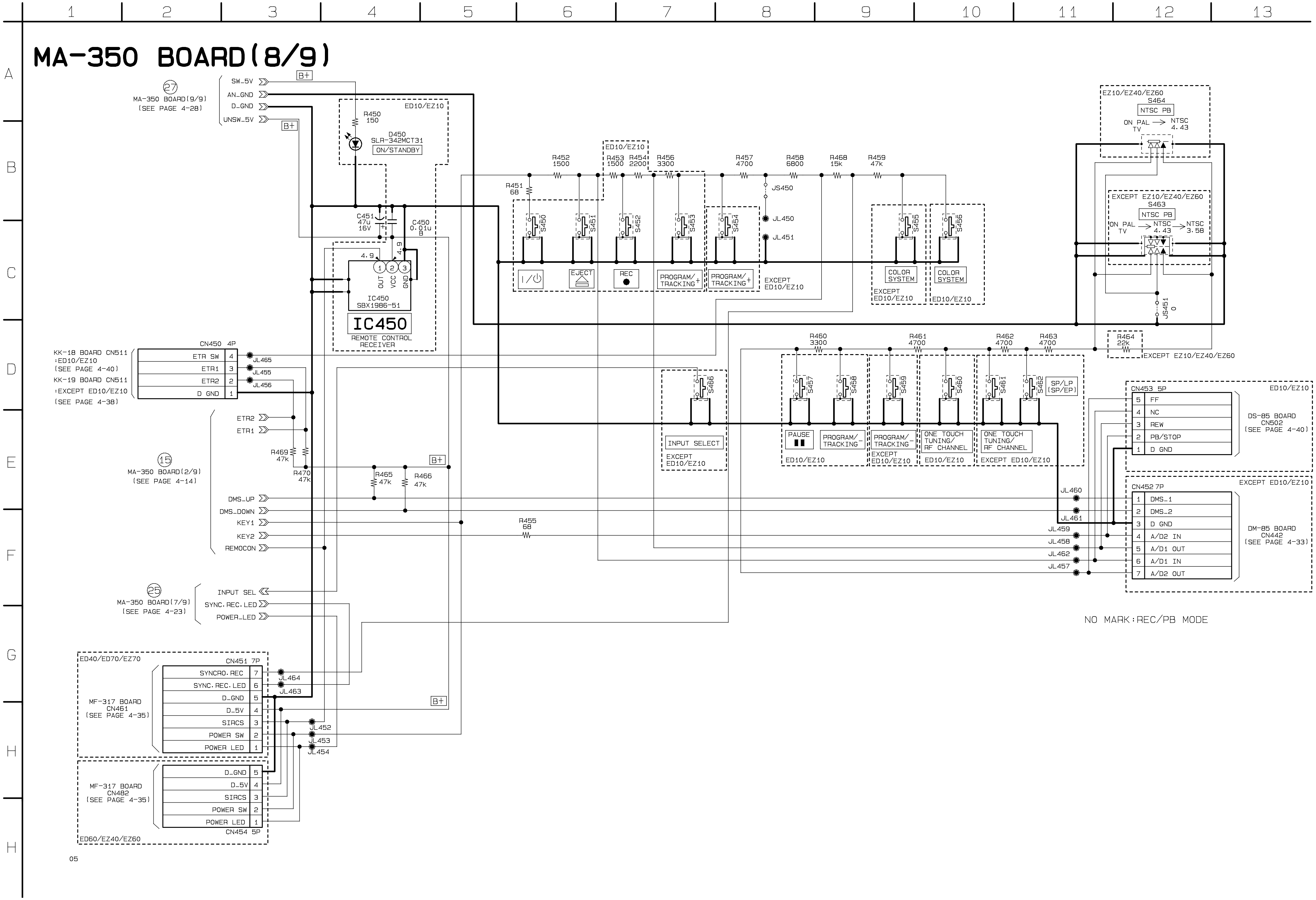
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-350 (FL DRIVE) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G
MA-350 BOARD(7/9)
25 MA-350 BOARD(8/9) (SEE PAGE 4-25)
SYNC.REC.LED
POWER LED
INPUT SEL
JL428
R432 10k
R426 4700
R429 4700
B+
R425 33k
CL420
2.5 0 0.2 4.9 4.9 -8.3 -8.3 -8.3 -8.3
F37 F36 F35
44 OSC
43 VSS
42 OSD MIX
41 RR LED
40 POWER LED
39 SYNC.REC.LED
38 VDD
37 G1
36 G2
35 G3
34 G4
5 MA-350 BOARD(1/9) (SEE PAGE 4-10)
MESECAM DET
C.KILLER DET
JL429
JL421
R428 470
16 MA-350 BOARD(2/9) (SEE PAGE 4-14)
OSD MIX
JL422
S_IN
JL423
S_OUT
JL424
S_CLK
JL425
FLD CS
JL426
R421 1k
R422 1k
R423 1k
R424 1k
1 AS/NZ DET/SECAM DET
0 2 C.KILLER DET
4.9 3 INPUT SEL
4.9 4 MESECAM DET
4.9 5 D OUT
0.1 6 D IN
7 VSS
4.9 8 CLK
4.6 9 CS
10 K1
11 K2
IC420 UPD16312GB-3BS
IC420
FL DRIVER
G5 33 -8.3
G6 32 -8.3
S16 31 -10.1 F31
S15 30 -0.4 F30
S14 29 -0.5 F29
S13 28 -10.1 F28
VEE 27 -10.2
S12 26 -10.1 F26
S11 25 -10.1 F25
S10 24 -2.5 F24
S9 23 -0.6 F23
12 K3
13 K4
14 VDD 4.9
15 S1 -1.6
16 S2 -7.9
17 S3 -9.8
18 S4 -9.8
19 S5 -0.2
20 S6 -4.1
21 S7 -4.4
22 S8 -4.4
F15 F16 F17 F18 F19 F20 F21 F22
ND420 FLUORESCENT INDICATOR TUBE
B-
1 F-
2 F-
F37 4 G1
F36 5 G2
F35 6 G3
7 G4
8 G5
9 G6
10 NC
11 NC
F31 12 P16
F30 13 P15
F29 14 P14
F28 15 P13
F26 16 P12
F25 17 P11
F24 18 P10
F23 19 P9
F22 20 P8
F21 21 P7
F20 22 P6
F19 23 P5
F18 24 P4
F17 25 P3
F16 26 P2
F15 27 P1
29 F+
30 F+
C421 0.1u F
26 MA-350 BOARD(9/9) (SEE PAGE 4-28)
UN_5V
D GND
-13V
+F
-F
C422 47u 16V
C423 0.1u F
C424 10u 16V
NO MARK:REC/PB MODE
05

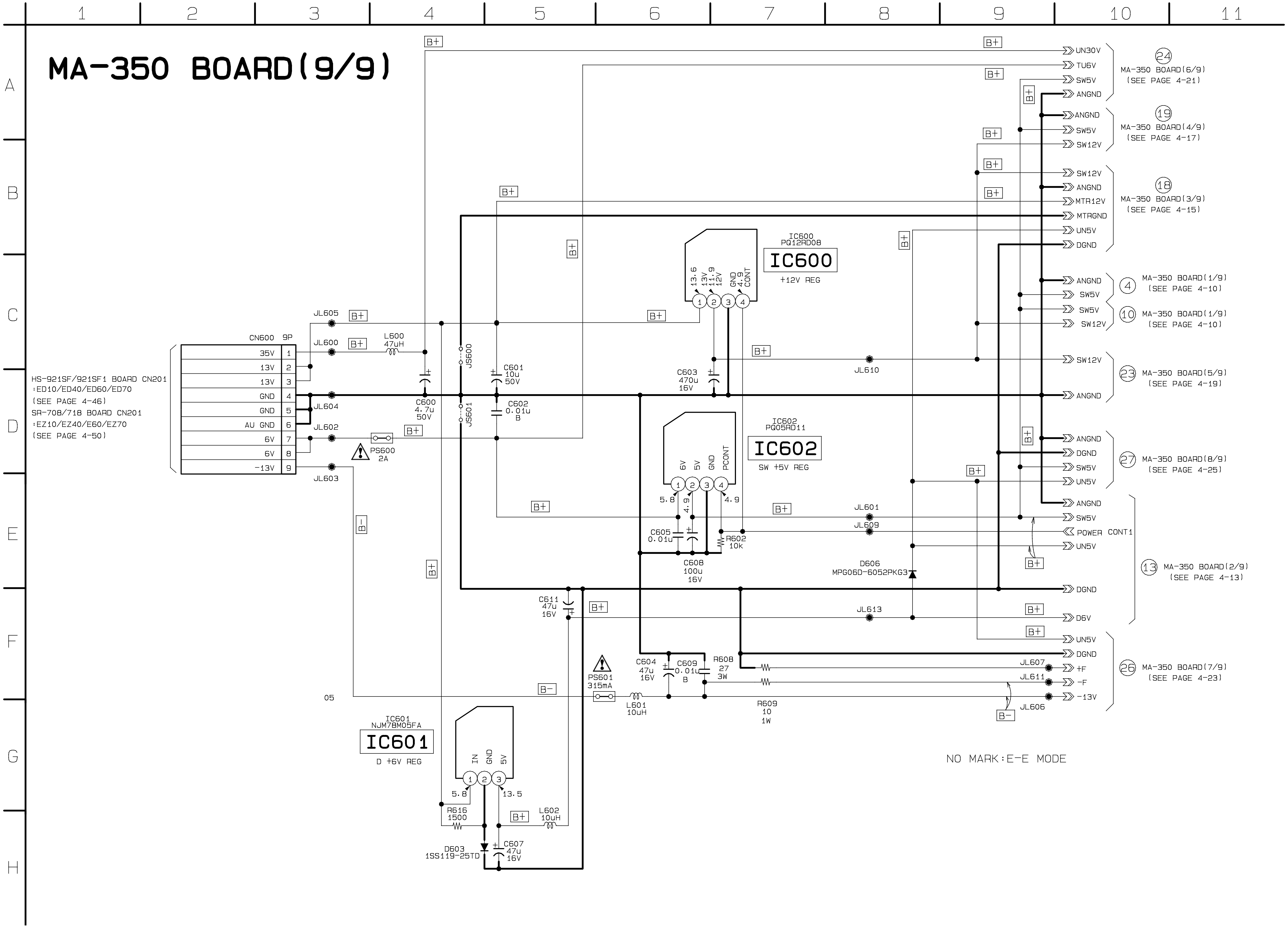
MA-350 (MODE CONTROL) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.
– Ref. No.: MA-350 board; 1,000 series –


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
H
MA-350 BOARD(8/9)
㉗ MA-350 BOARD(9/9) (SEE PAGE 4-28)
SW_5V
AN_GND
D_GND
UNSW_5V
B+
ED10/EZ10
R450 150
D450 SLR-342MCT31
ON/STANDBY
C451 47u 16V
C450 0.01u B
4.9
4.9
OUT
VCC
GND
IC450 SBX1986-51
IC450
REMOTE CONTROL RECEIVER
R451 68
R452 1500
ED10/EZ10
R453 1500
R454 2200
R456 3300
R457 4700
R458 6800
R468 15k
R459 47k
JS450
JL450
JL451
S450
S451
S452
S453
S454
S455
S456
I/⏻
EJECT
REC
PROGRAM/ TRACKING+
PROGRAM/ TRACKING+
EXCEPT ED10/EZ10
COLOR SYSTEM
COLOR SYSTEM
EXCEPT ED10/EZ10
ED10/EZ10
EZ10/EZ40/EZ60
S464
NTSC PB
ON PAL TV → NTSC 4.43
EXCEPT EZ10/EZ40/EZ60
S463
NTSC PB
ON PAL TV → NTSC 4.43 → NTSC 3.58
JS451 0
R464 22k
EXCEPT EZ10/EZ40/EZ60
KK-18 BOARD CN511 :ED10/EZ10 (SEE PAGE 4-40)
KK-19 BOARD CN511 :EXCEPT ED10/EZ10 (SEE PAGE 4-38)
CN450 4P
ETR SW 4
ETR1 3
ETR2 2
D GND 1
JL465
JL455
JL456
R460 3300
R461 4700
R462 4700
R463 4700
S466
INPUT SELECT
EXCEPT ED10/EZ10
S457
S458
S459
S460
S461
S462
SP/LP (SP/EP)
PAUSE ▮▮
PROGRAM/ TRACKING−
PROGRAM/ TRACKING−
ONE TOUCH TUNING/ RF CHANNEL
ONE TOUCH TUNING/ RF CHANNEL
ED10/EZ10
EXCEPT ED10/EZ10
ED10/EZ10
EXCEPT ED10/EZ10
CN453 5P
ED10/EZ10
5 FF
4 NC
3 REW
2 PB/STOP
1 D GND
DS-85 BOARD CN502 (SEE PAGE 4-40)
ETR2
ETR1
R469 47k
R470 47k
⑮ MA-350 BOARD(2/9) (SEE PAGE 4-14)
R465 47k
R466 47k
DMS_UP
DMS_DOWN
KEY1
KEY2
REMOCON
R455 68
JL460
JL461
JL459
JL458
JL462
JL457
CN452 7P
EXCEPT ED10/EZ10
1 DMS_1
2 DMS_2
3 D GND
4 A/D2 IN
5 A/D1 OUT
6 A/D1 IN
7 A/D2 OUT
DM-85 BOARD CN442 (SEE PAGE 4-33)
㉕ MA-350 BOARD(7/9) (SEE PAGE 4-23)
INPUT SEL
SYNC.REC.LED
POWER_LED
NO MARK:REC/PB MODE
ED40/ED70/EZ70
CN451 7P
MF-317 BOARD CN461 (SEE PAGE 4-35)
SYNCRO.REC 7
SYNC.REC.LED 6
D_GND 5
D_5V 4
SIRCS 3
POWER SW 2
POWER LED 1
JL464
JL463
JL452
JL453
JL454
MF-317 BOARD CN482 (SEE PAGE 4-35)
D_GND 5
D_5V 4
SIRCS 3
POWER SW 2
POWER LED 1
CN454 5P
ED60/EZ40/EZ60
05

MODE CONTROL
MA-350 (8/9)

MA-350 (POWER SUPPLY) SCHEMATIC DIAGRAM • See page 4-5 for printed wiring board.

– Ref. No.: MA-350 board; 1,000 series –


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
MA-350 BOARD(9/9)
B+
B-
UN30V
TU6V
SW5V
ANGND
24
MA-350 BOARD(6/9)
(SEE PAGE 4-21)
ANGND
SW5V
SW12V
19
MA-350 BOARD(4/9)
(SEE PAGE 4-17)
SW12V
ANGND
MTR12V
MTRGND
UN5V
DGND
18
MA-350 BOARD(3/9)
(SEE PAGE 4-15)
ANGND
SW5V
SW5V
SW12V
4
MA-350 BOARD(1/9)
(SEE PAGE 4-10)
10
MA-350 BOARD(1/9)
(SEE PAGE 4-10)
SW12V
ANGND
23
MA-350 BOARD(5/9)
(SEE PAGE 4-19)
ANGND
DGND
SW5V
UN5V
27
MA-350 BOARD(8/9)
(SEE PAGE 4-25)
ANGND
SW5V
POWER CONT1
UN5V
DGND
D6V
13
MA-350 BOARD(2/9)
(SEE PAGE 4-13)
UN5V
DGND
+F
-F
-13V
26
MA-350 BOARD(7/9)
(SEE PAGE 4-23)
IC600
PQ12RD08
IC600
+12V REG
13.6
13V
11.9
12V
GND
4.9
CONT
IC602
PQ05RD11
IC602
SW +5V REG
6V
5V
GND
PCONT
5.8
4.9
4.9
IC601
NJM78M05FA
IC601
D +6V REG
IN
GND
5V
5.8
13.5
CN600 9P
35V 1
13V 2
13V 3
GND 4
GND 5
AU GND 6
6V 7
6V 8
-13V 9
HS-921SF/921SF1 BOARD CN201
:ED10/ED40/ED60/ED70
(SEE PAGE 4-46)
SR-708/718 BOARD CN201
:EZ10/EZ40/E60/EZ70
(SEE PAGE 4-50)
JL605
JL600
JL604
JL602
JL603
JL610
JL601
JL609
JL613
JL607
JL611
JL606
L600
47uH
C600
4.7u
50V
C601
10u
50V
C602
0.01u
B
JS600
JS601
PS600
2A
C603
470u
16V
C605
0.01u
C608
100u
16V
R602
10k
D606
MPG06D-6052PKG3
C611
47u
16V
PS601
315mA
L601
10uH
C604
47u
16V
C609
0.01u
B
R608
27
3W
R609
10
1W
05
R616
1500
L602
10uH
D603
1SS119-25TD
C607
47u
16V
NO MARK:E-E MODE

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

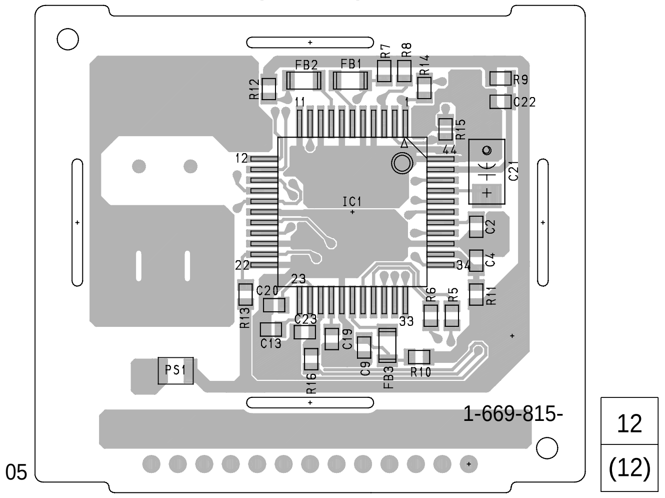
NK-11 (NICAM) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: NK-11 board; 2,000 series –

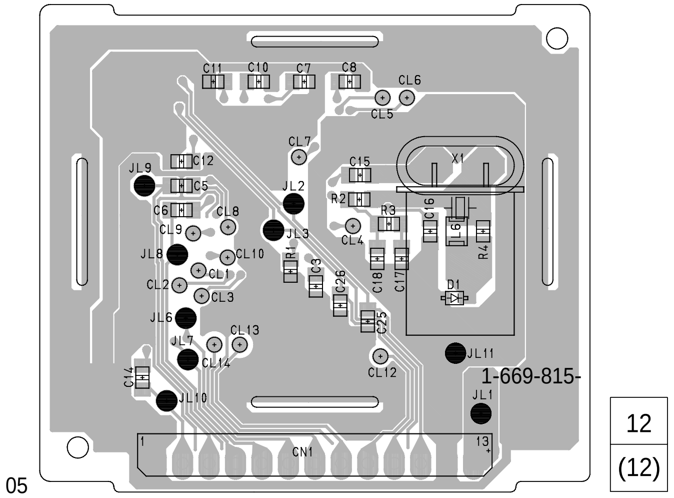
– SLV-ED70/EZ70: NZ –

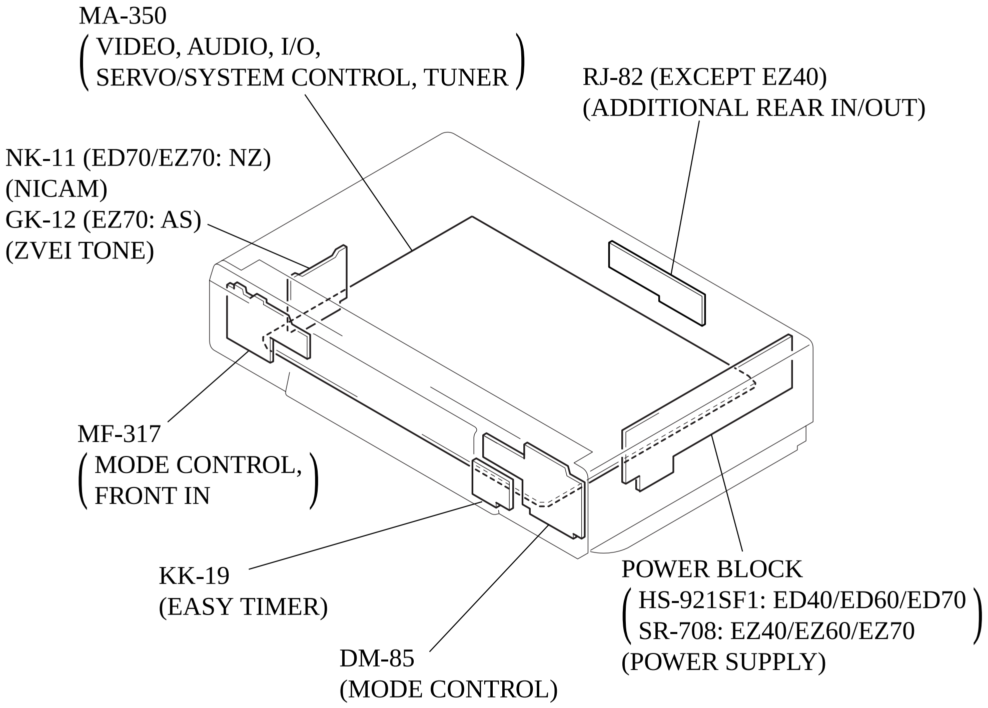
There are few cases that the part isn't mounted in this model is printed on this diagram.

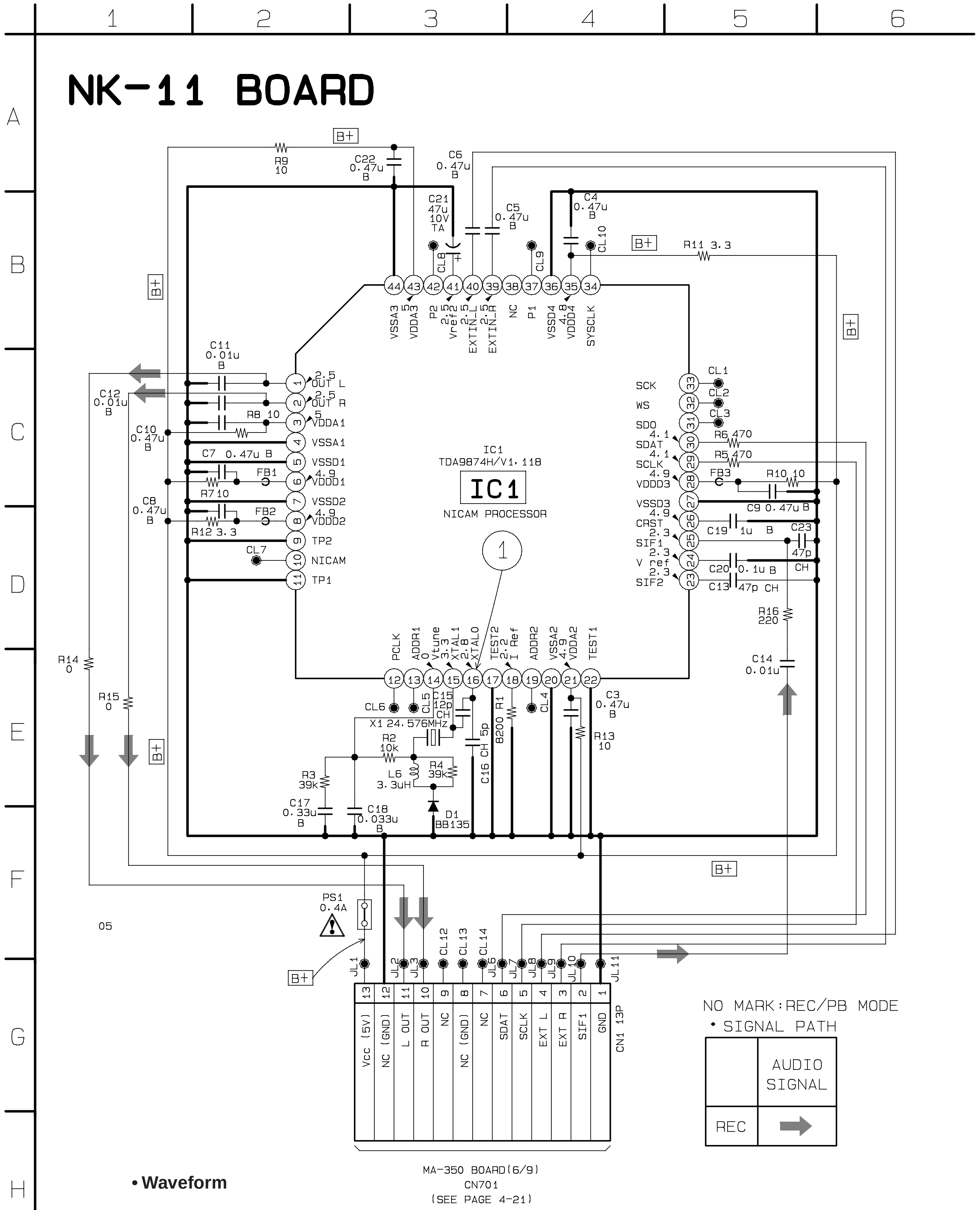
NK-11 BOARD(SIDE A)


FB2
FB1
R7
R8
R14
R9
C22
R12
11
R15
44
C21
12
IC1
C2
C4
22
34
R11
C20
23
R6
R5
R13
C23
33
C13
C19
C9
FB3
R10
R16
PS1
1-669-815-
12
(12)
05

NK-11 BOARD(SIDE B)

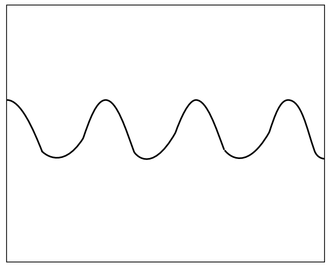

C11
C10
C7
C8
CL6
CL5
CL7
JL9
C12
C15
X1
C5
JL2
R2
C6
CL8
CL9
R3
C16
L6
JL3
CL4
JL8
CL10
R4
CL1
R1
CL2
CL3
C26
C18
C17
D1
JL6
CL13
C25
JL7
CL14
JL11
C14
CL12
1-669-815-
JL10
JL1
CN1
1
13
12
(12)
05


MA-350
(VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL, FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)


1
2
3
4
5
6
A
B
C
D
E
F
G
H
NK-11 BOARD
B+
R9 10
C22 0.47u B
C6 0.47u B
C21 47u 10V TA
C5 0.47u B
C4 0.47u B
CL8
CL9
CL10
R11 3.3
VSSA3
VDDA3 5
P2
Vref2 2.5
EXTIN_L 2.5
EXTIN_R 2.5
NC
P1
VSSD4
VDDD4 4.8
SYSCLK
C11 0.01u B
C12 0.01u B
OUT L 2.5
OUT R 2.5
VDDA1 5
VSSA1
R8 10
C10 0.47u B
C7 0.47u B
FB1
VSSD1
VDDD1 4.9
R7 10
C8 0.47u B
VSSD2
VDDD2 4.9
FB2
R12 3.3
CL7
TP2
NICAM
TP1
IC1
TDA9874H/V1.118
IC1
NICAM PROCESSOR
SCK
WS
SDO
SDAT 4.1
SCLK 4.1
VDDD3 4.9
VSSD3
CRST 4.9
SIF1 2.3
V ref 2.3
SIF2 2.3
CL1
CL2
CL3
R6 470
R5 470
FB3
R10 10
C9 0.47u B
C19 1u B
C23 47p
CH
C20 0.1u B
C13 47p CH
R16 220
C14 0.01u
R14 0
R15 0
PCLK
ADDR1 0
Vtune 3.3
XTAL1 2.8
XTAL0 2.8
TEST2 2.2
I Ref
ADDR2
VSSA2
VDDA2 4.9
TEST1
CL6
CL5
C15 12p CH
X1 24.576MHz
R1 8200
CL4
C3 0.47u B
R13 10
R2 10k
C16 CH 5p
R3 39k
L6 3.3uH
R4 39k
C17 0.33u B
C18 0.033u B
D1 BB135
PS1 0.4A
05
JL1
JL2
JL3
CL12
CL13
CL14
JL6
JL7
JL8
JL9
JL10
JL11
13 Vcc (5V)
12 NC (GND)
11 L OUT
10 R OUT
9 NC
8 NC (GND)
7 NC
6 SDAT
5 SCLK
4 EXT L
3 EXT R
2 SIF1
1 GND
CN1 13P
MA-350 BOARD(6/9)
CN701
(SEE PAGE 4-21)
NO MARK:REC/PB MODE
• SIGNAL PATH
AUDIO SIGNAL
REC

• Waveform

❶ IC1 ⑯ REC/PB



740 mVp-p (24.576 MHz)

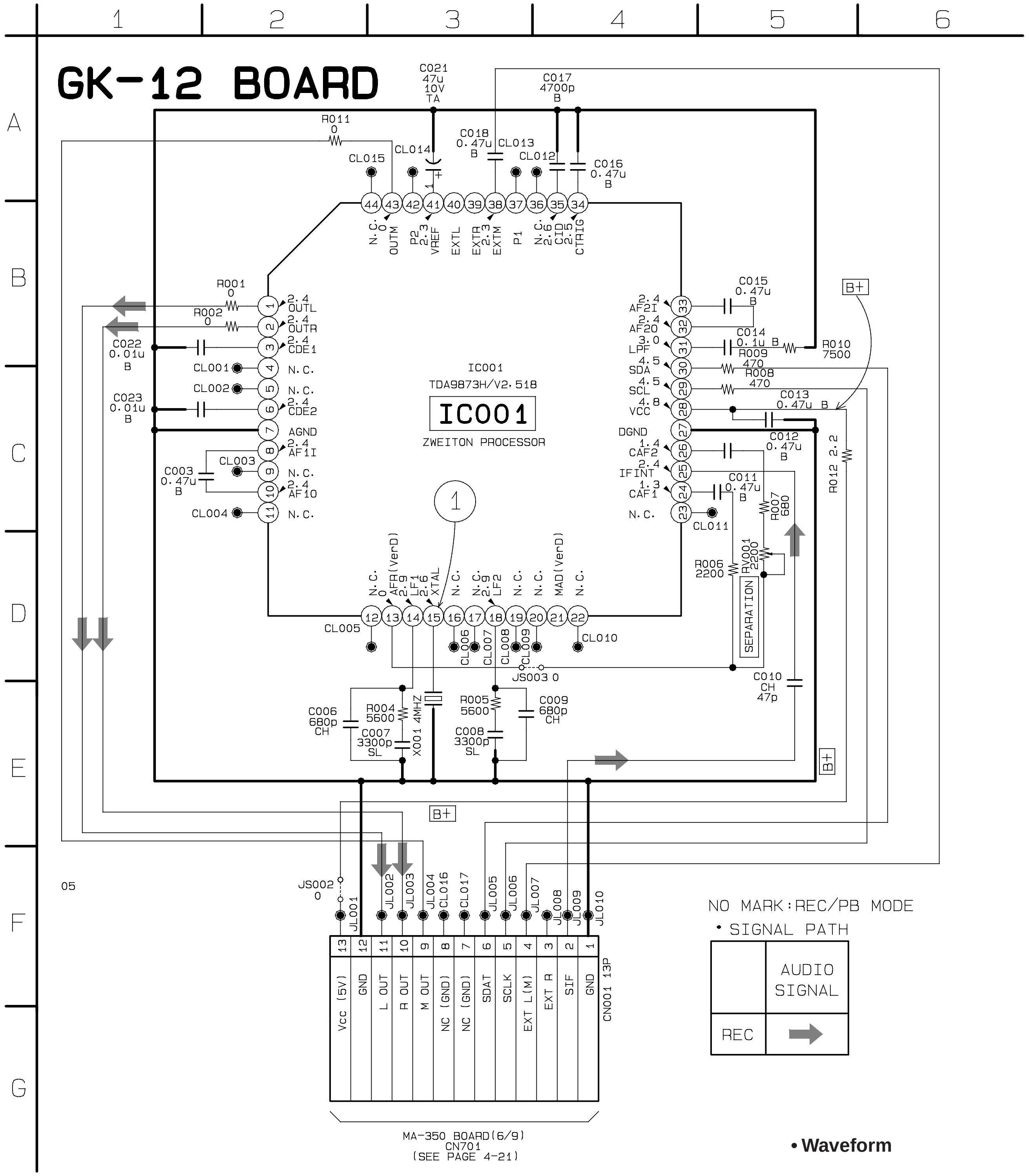
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

GK-12 (ZVEI TONE) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: GK-12 board; 1,000 series –

– SLV-EZ70: AS –

There are few cases that the part isn't mounted in this model is printed on this diagram.


GK-12 BOARD
1
2
3
4
5
6
A
B
C
D
E
F
G
IC001
TDA9873H/V2.518
IC001
ZWEITON PROCESSOR
C021 47u 10V TA
C017 4700p B
R011 0
CL014
CL015
C018 0.47u B
CL013
CL012
C016 0.47u B
N.C.
OUTM
P2
VREF
EXTL
EXTR
EXTM
P1
N.C.
CID
CTRIG
R001 0
R002 0
OUTL
OUTR
C022 0.01u B
CDE1
CL001
N.C.
CL002
N.C.
C023 0.01u B
CDE2
AGND
AF1I
CL003
N.C.
C003 0.47u B
AF1O
CL004
N.C.
C015 0.47u B
AF2I
AF2O
C014 0.1u B
LPF
R009 470
SDA
R008 470
SCL
VCC
C013 0.47u B
R010 7500
DGND
C012 0.47u B
CAF2
R012 2.2
IFINT
C011 0.47u B
CAF1
N.C.
CL011
R007 680
R006 2200
RV001 2200
SEPARATION
N.C.
AFR(VerD)
LF1
XTAL
N.C.
N.C.
LF2
N.C.
N.C.
MAD(VerD)
N.C.
CL005
CL006
CL007
CL008
CL009
CL010
JS003 0
C010 CH 47p
C006 680p CH
R004 5600
C007 3300p SL
X001 4MHz
R005 5600
C009 680p CH
C008 3300p SL
B+
JS002 0
JL001
JL002
JL003
JL004
CL016
CL017
JL005
JL006
JL007
JL008
JL009
JL010
Vcc (5V)
GND
L OUT
R OUT
M OUT
NC (GND)
NC (GND)
SDAT
SCLK
EXT L(M)
EXT R
SIF
GND
CN001 13P
MA-350 BOARD(6/9) CN701 (SEE PAGE 4-21)
05

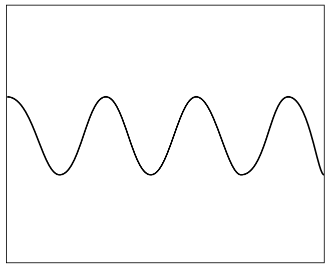
NO MARK:REC/PB MODE

• SIGNAL PATH

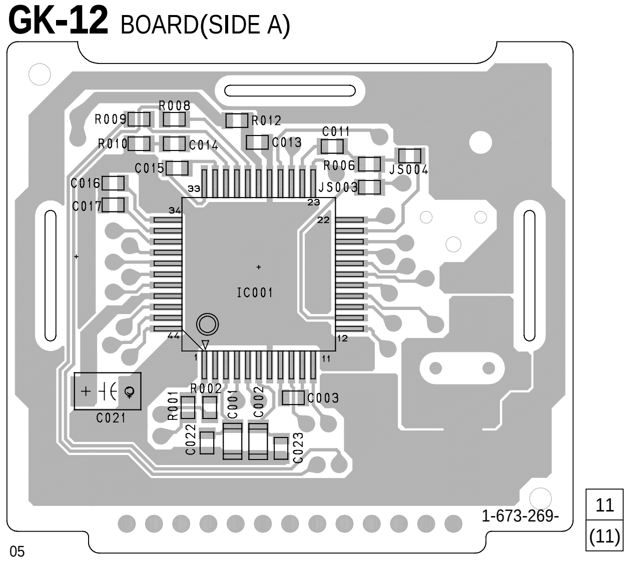
	AUDIO SIGNAL
REC	➡

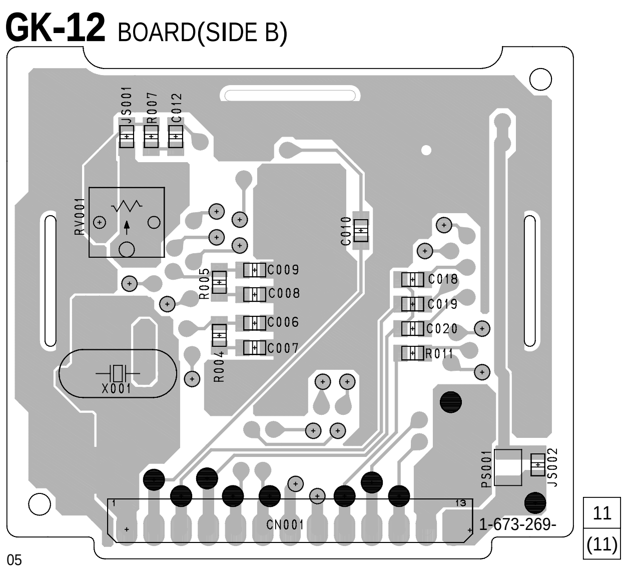
• Waveform

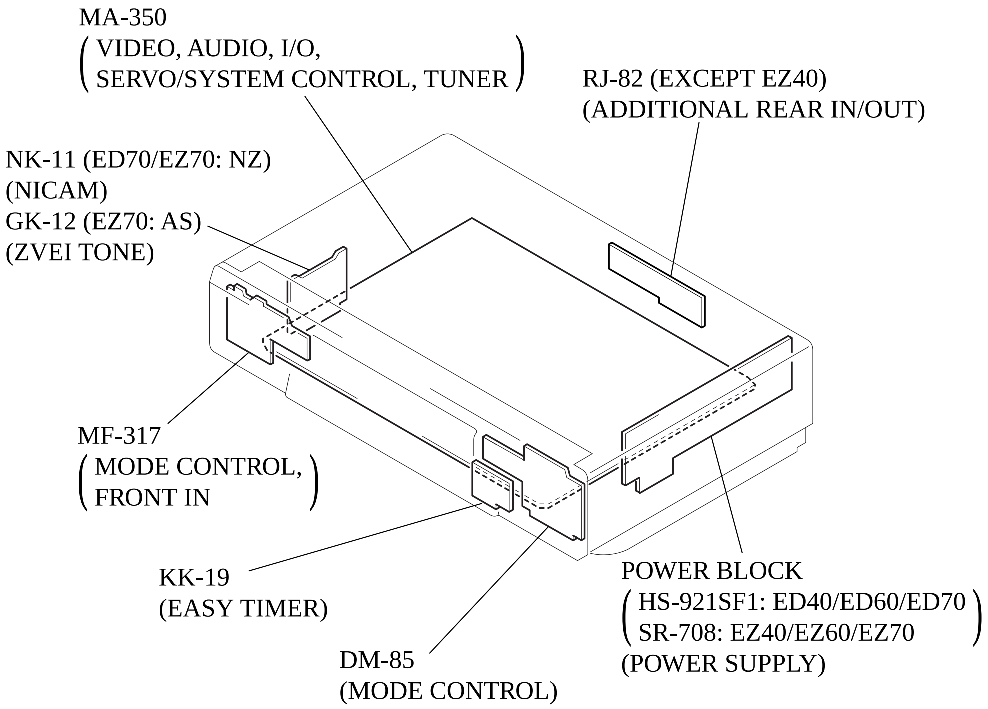
❶ IC001 ⑮ REC/PB



148 mVp-p (4 MHz)


GK-12 BOARD(SIDE A)
R009
R008
R010
R012
C014
C013
C015
C011
R006
JS003
JS004
C016
C017
IC001
C021
R001
R002
C001
C002
C003
C022
C023
1-673-269-
11
(11)
05


GK-12 BOARD(SIDE B)
JS001
R007
C012
RV001
C010
R005
C009
C008
C006
C007
R004
C018
C019
C020
R011
X001
PS001
JS002
CN001
1-673-269-
11
(11)
05


MA-350
(VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL, FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)

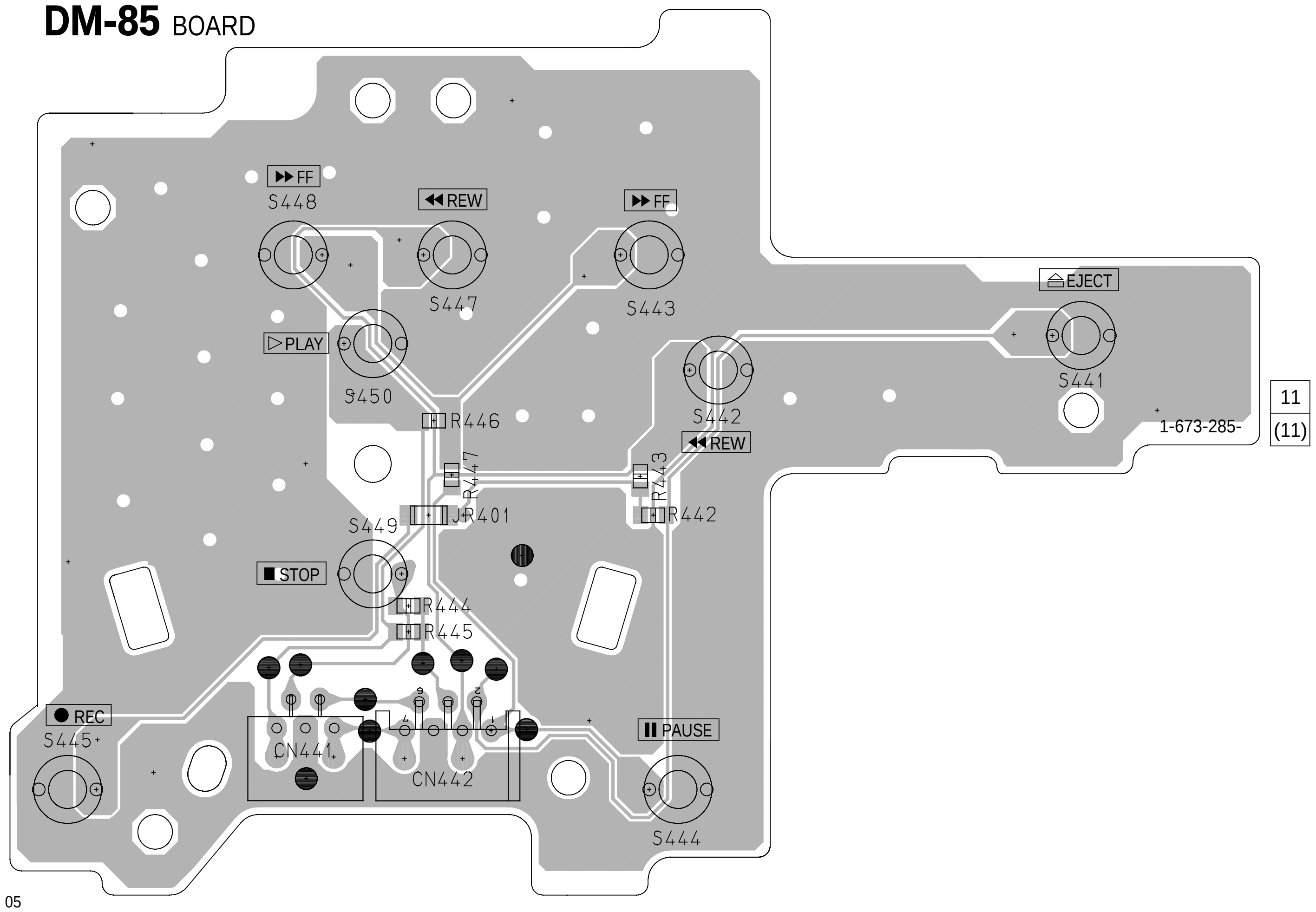
ZVEI TONE
GK-12

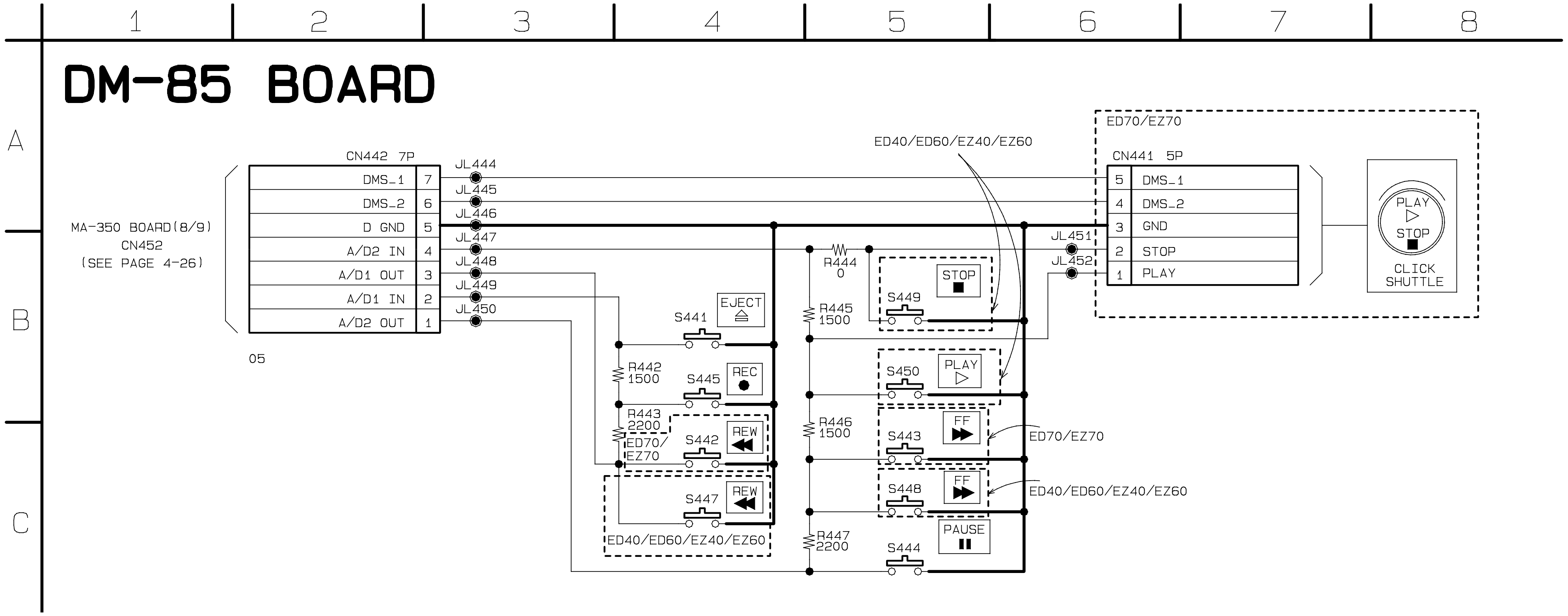
DM-85 (MODE CONTROL) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: DM-85 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

– SLV-ED40/ED60/ED70/EZ40/EZ60/EZ70 –


DM-85 BOARD
FF
S448
REW
S447
FF
S443
EJECT
S441
PLAY
S450
S442
REW
R446
R447
R443
R442
JR401
S449
STOP
R444
R445
REC
S445
CN441
CN442
PAUSE
S444
1-673-285-
11
(11)
05

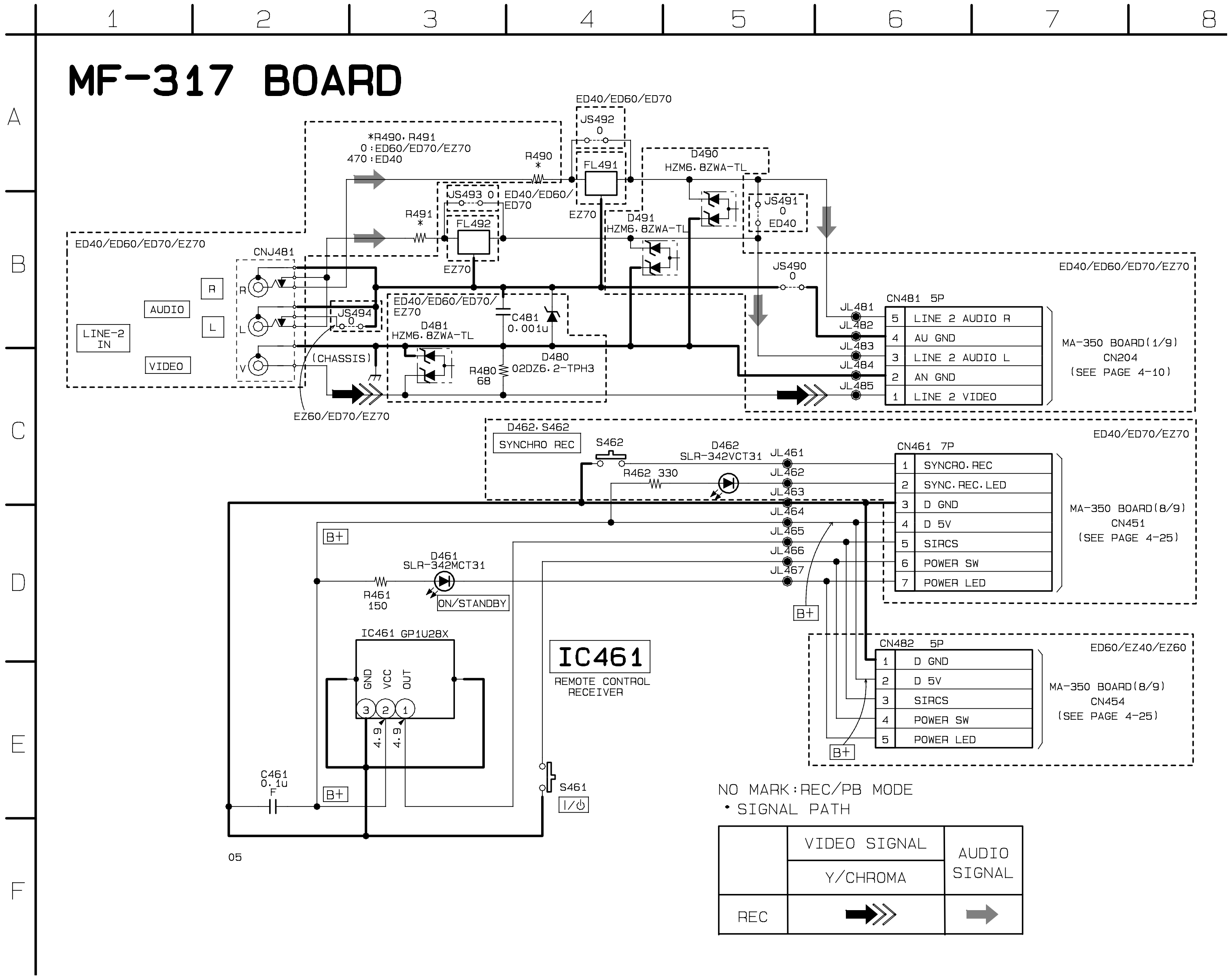

1
2
3
4
5
6
7
8
A
B
C
DM-85 BOARD
CN442 7P
DMS_1 7
DMS_2 6
D GND 5
A/D2 IN 4
A/D1 OUT 3
A/D1 IN 2
A/D2 OUT 1
JL444
JL445
JL446
JL447
JL448
JL449
JL450
MA-350 BOARD(8/9)
CN452
(SEE PAGE 4-26)
05
ED40/ED60/EZ40/EZ60
ED70/EZ70
CN441 5P
5 DMS_1
4 DMS_2
3 GND
2 STOP
1 PLAY
JL451
JL452
PLAY
STOP
CLICK
SHUTTLE
R444
0
R445
1500
S449
STOP
S441
EJECT
R442
1500
S445
REC
S450
PLAY
R443
2200
ED70/
EZ70
S442
REW
R446
1500
S443
FF
ED70/EZ70
S447
REW
S448
FF
ED40/ED60/EZ40/EZ60
ED40/ED60/EZ40/EZ60
R447
2200
S444
PAUSE

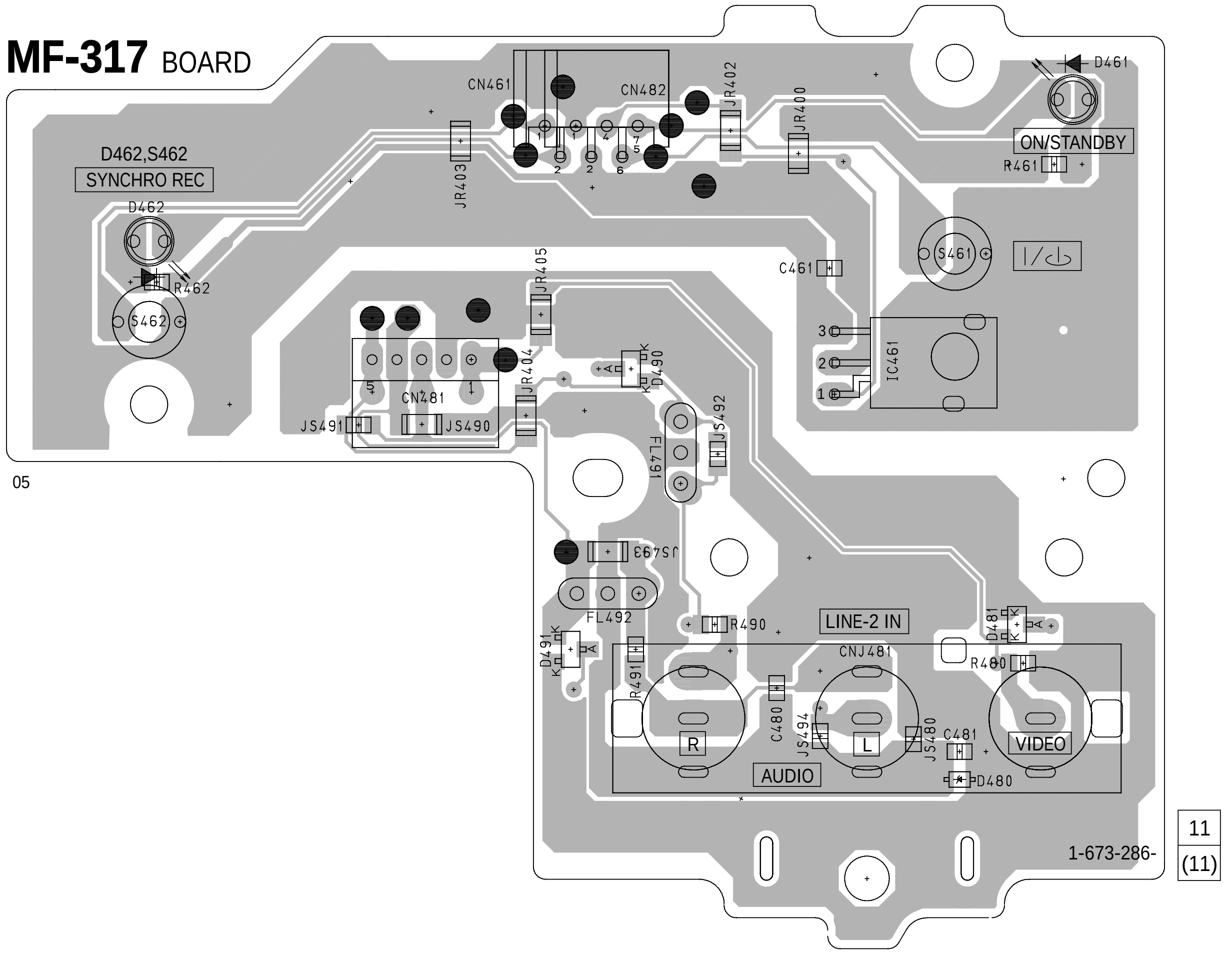
MF-317 (MODE CONTROL, FRONT IN) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: MF-317 board; 2,000 series –

– SLV-ED40/ED60/ED70/EZ40/EZ60/EZ70 –

There are few cases that the part isn't mounted in this model is printed on this diagram.


1
2
3
4
5
6
7
8
A
B
C
D
E
F
MF-317 BOARD
*R490, R491
0 : ED60/ED70/EZ70
470 : ED40
R490 *
R491 *
ED40/ED60/ED70
JS492 0
FL491
D490 HZM6.8ZWA-TL
JS493 0
ED40/ED60/ED70
FL492
EZ70
D491 HZM6.8ZWA-TL
JS491 0 ED40
ED40/ED60/ED70/EZ70
CNJ481
AUDIO
R
L
LINE-2 IN
VIDEO
JS494 0
(CHASSIS)
ED40/ED60/ED70/EZ70
D481 HZM6.8ZWA-TL
C481 0.001u
D480 02DZ6.2-TPH3
R480 68
JS490 0
EZ60/ED70/EZ70
JL481
JL482
JL483
JL484
JL485
CN481 5P
5 LINE 2 AUDIO R
4 AU GND
3 LINE 2 AUDIO L
2 AN GND
1 LINE 2 VIDEO
MA-350 BOARD (1/9) CN204 (SEE PAGE 4-10)
D462, S462
SYNCHRO REC
S462
D462 SLR-342VCT31
R462 330
JL461
JL462
JL463
JL464
JL465
JL466
JL467
CN461 7P
1 SYNCRO.REC
2 SYNC.REC.LED
3 D GND
4 D 5V
5 SIRCS
6 POWER SW
7 POWER LED
MA-350 BOARD (8/9) CN451 (SEE PAGE 4-25)
ED40/ED70/EZ70
B+
D461 SLR-342MCT31
R461 150
ON/STANDBY
IC461 GP1U28X
GND
VCC
OUT
4.9
4.9
IC461
REMOTE CONTROL RECEIVER
CN482 5P
1 D GND
2 D 5V
3 SIRCS
4 POWER SW
5 POWER LED
MA-350 BOARD (8/9) CN454 (SEE PAGE 4-25)
ED60/EZ40/EZ60
C461 0.1u F
S461
I/⏻
05
NO MARK : REC/PB MODE
• SIGNAL PATH
VIDEO SIGNAL
Y/CHROMA
AUDIO SIGNAL
REC

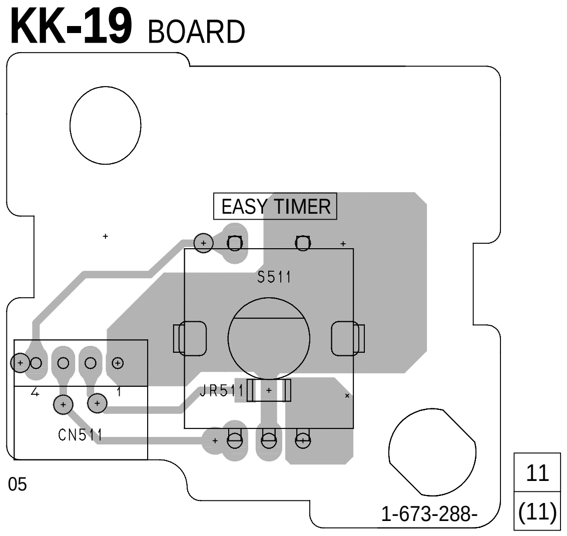

MF-317 BOARD
D462,S462
SYNCHRO REC
D462
R462
S462
CN461
CN482
JR402
JR400
JR403
D461
ON/STANDBY
R461
S461
I/⏻
C461
JR405
IC461
JR404
CN481
JS491
JS490
D490
JS492
FL491
JS493
FL492
R490
LINE-2 IN
D481
D491
R491
CNJ481
R480
C480
JS494
JS480
C481
D480
R
L
AUDIO
VIDEO
05
1-673-286-
11
(11)

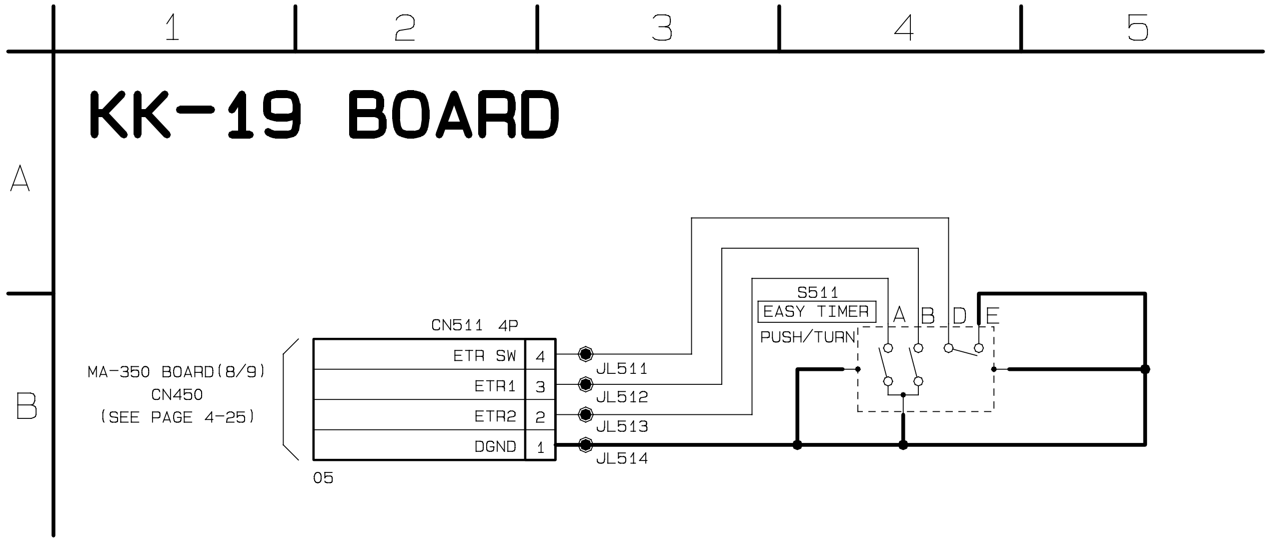
KK-19 (EASY TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

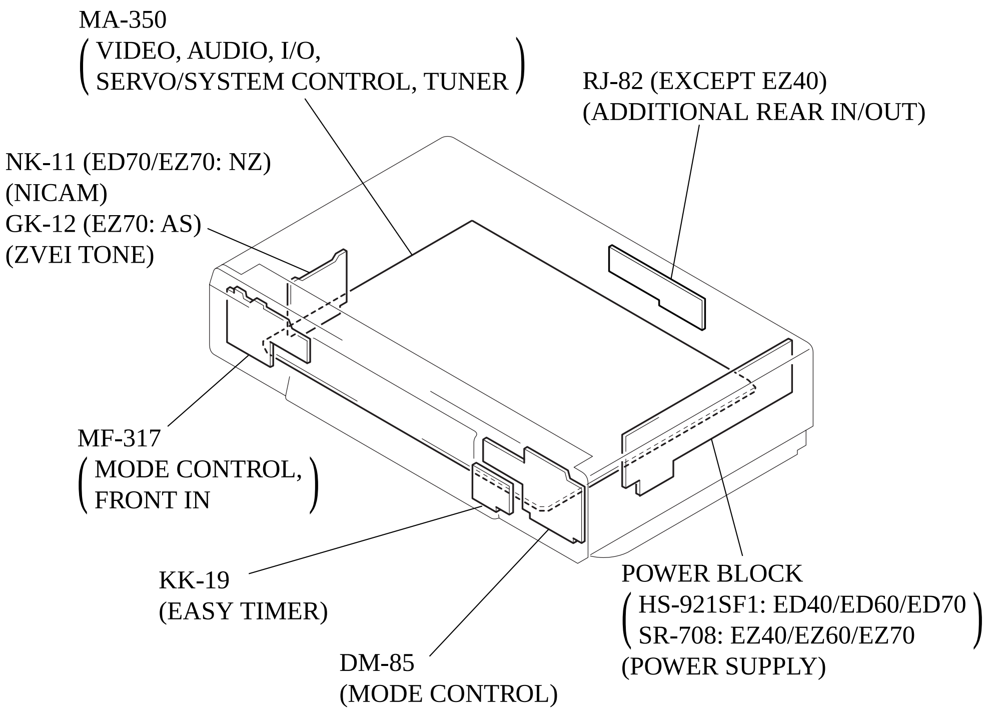
– Ref. No.: KK-19 board; 2,000 series –

– SLV-ED40/ED60/ED70/EZ40/EZ60/EZ70 –

There are few cases that the part isn't mounted in this model is printed on this diagram.


KK-19 BOARD
EASY TIMER
S511
JR511
CN511
4
1
05
1-673-288-
11
(11)


1
2
3
4
5
A
B
KK-19 BOARD
MA-350 BOARD(8/9)
CN450
(SEE PAGE 4-25)
CN511 4P
ETR SW
ETR1
ETR2
DGND
4
3
2
1
05
JL511
JL512
JL513
JL514
S511
EASY TIMER
PUSH/TURN
A
B
D
E


MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL,
FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)

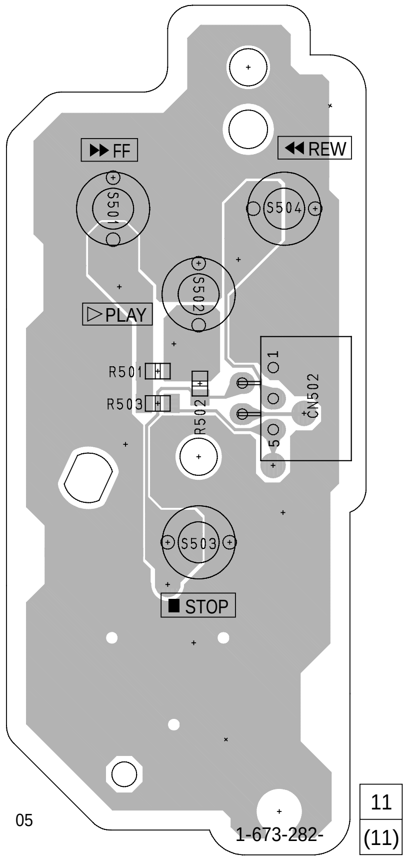
DS-85 (MODE CONTROL), KK-18 (EASY TIMER) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

– Ref. No.: DS-85 Board, KK-18 board; 1,000 series –

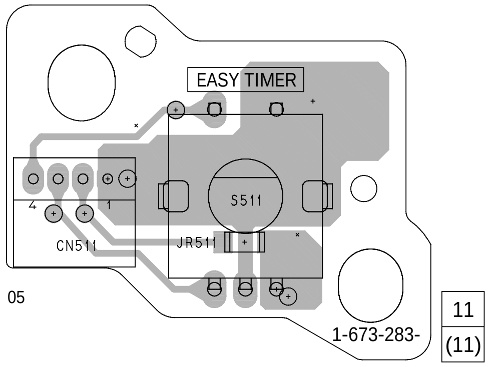
– SLV-ED10/EZ10 –

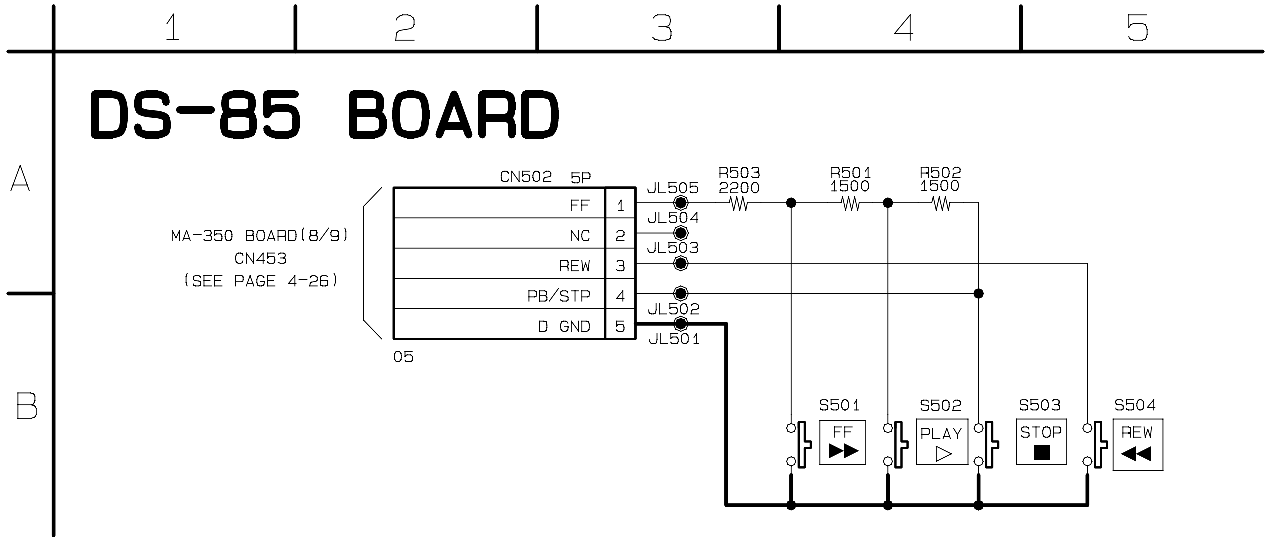
There are few cases that the part isn't mounted in this model is printed on this diagram.

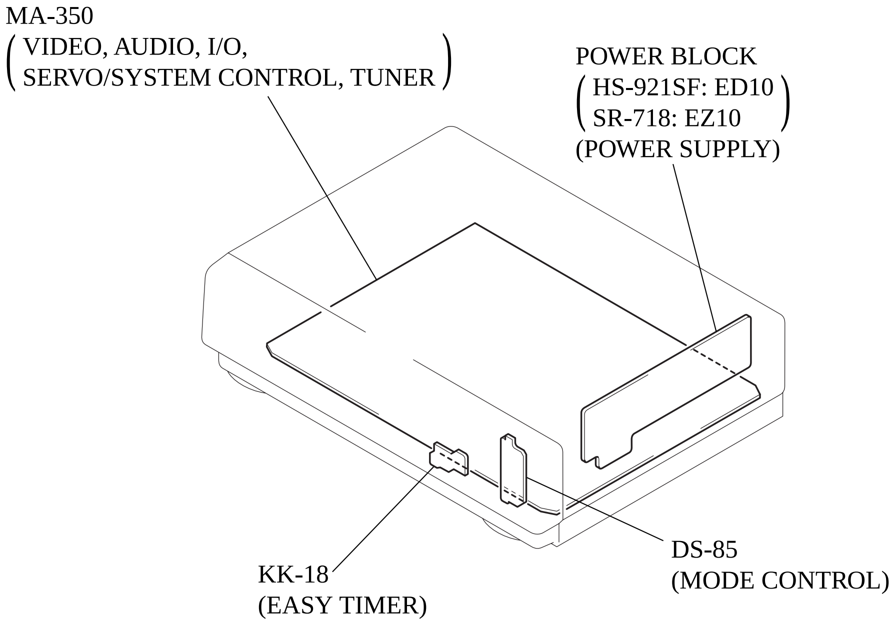
DS-85 BOARD

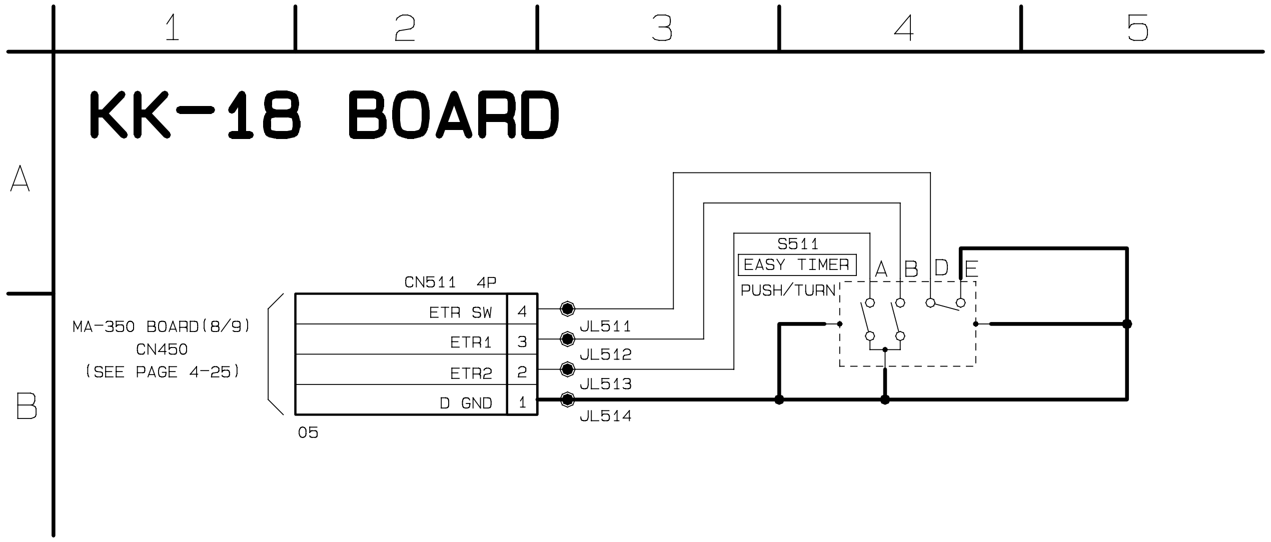

FF
REW
S501
S504
S502
PLAY
R501
R503
R502
CN502
1
5
S503
STOP
05
1-673-282-
11
(11)

KK-18 BOARD


EASY TIMER
S511
CN511
JR511
4
1
05
1-673-283-
11
(11)


1
2
3
4
5
A
B
DS-85 BOARD
MA-350 BOARD(8/9)
CN453
(SEE PAGE 4-26)
CN502 5P
FF 1
NC 2
REW 3
PB/STP 4
D GND 5
05
JL505
JL504
JL503
JL502
JL501
R503
2200
R501
1500
R502
1500
S501
FF
S502
PLAY
S503
STOP
S504
REW


MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
POWER BLOCK
(HS-921SF: ED10
SR-718: EZ10)
(POWER SUPPLY)
KK-18
(EASY TIMER)
DS-85
(MODE CONTROL)

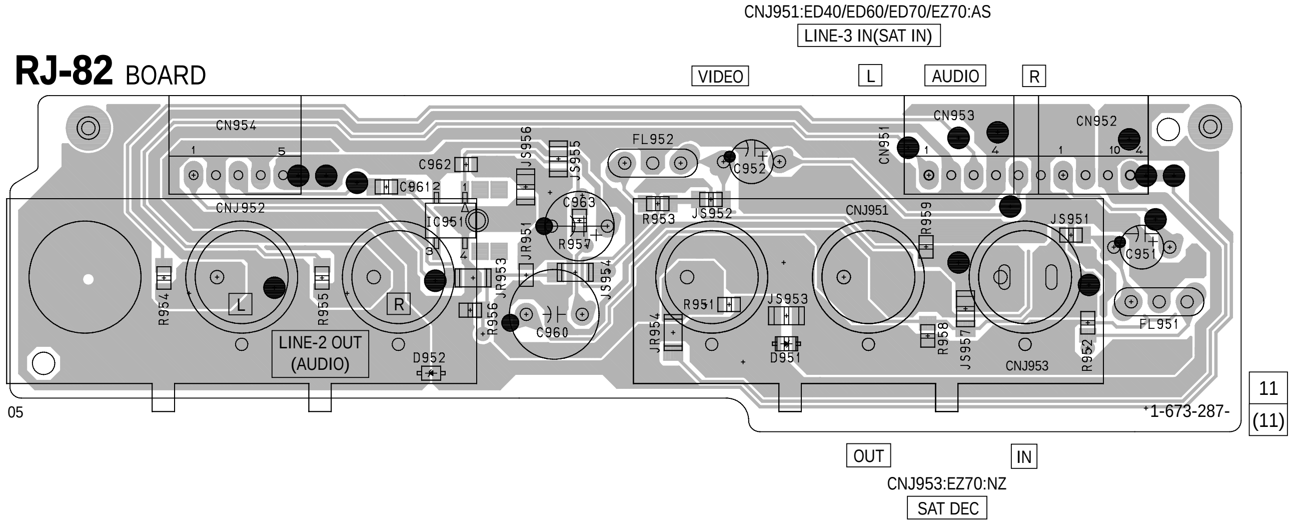

1
2
3
4
5
A
B
KK-18 BOARD
MA-350 BOARD(8/9)
CN450
(SEE PAGE 4-25)
CN511 4P
ETR SW 4
ETR1 3
ETR2 2
D GND 1
05
JL511
JL512
JL513
JL514
S511
EASY TIMER
PUSH/TURN
A
B
D
E

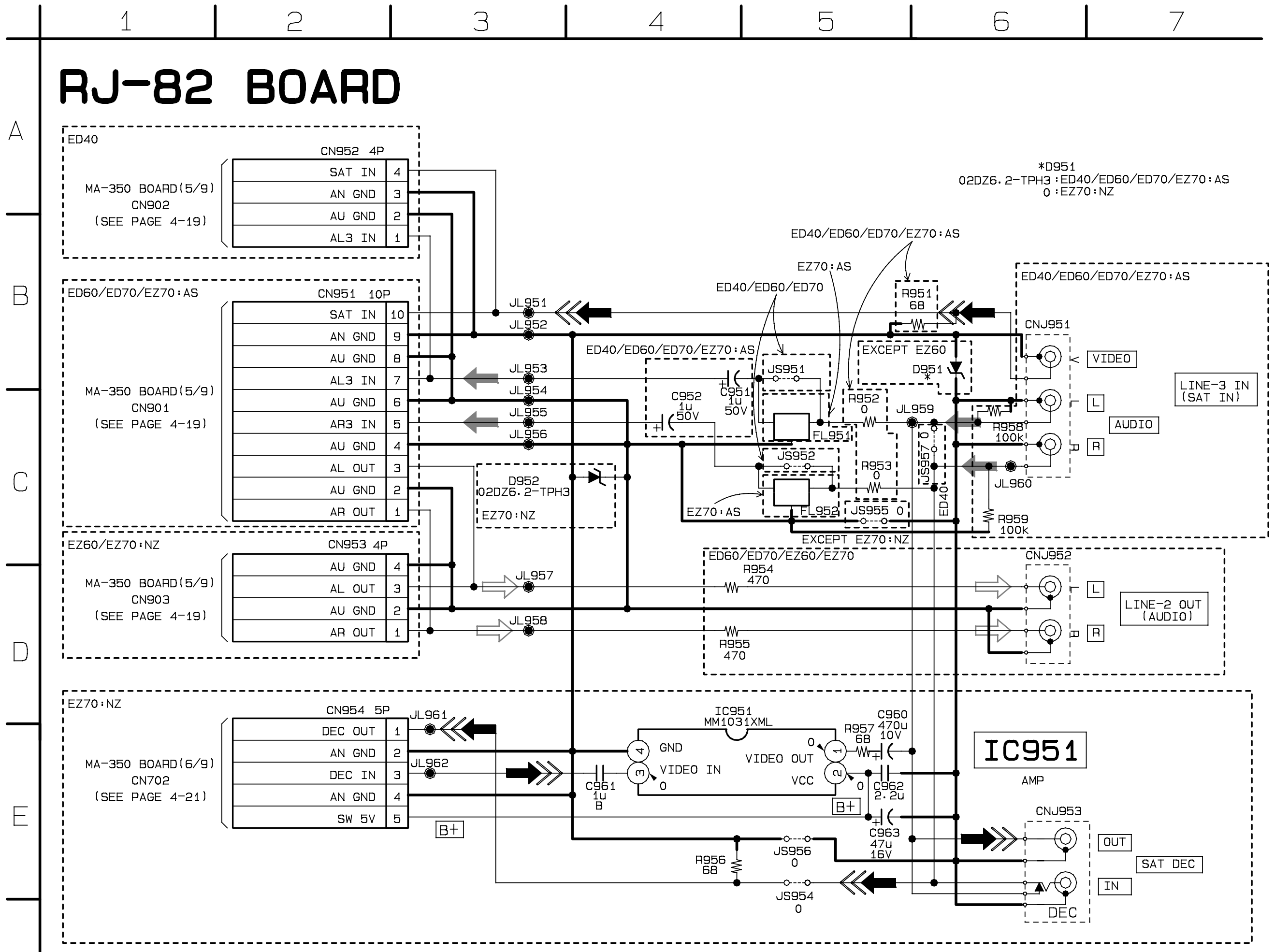
RJ-82 (ADDITIONAL REAR IN/OUT) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: RJ-82 Board board; 1,000 series –

– SLV-ED40/ED60/ED70/EZ60/EZ70 –

There are few cases that the part isn't mounted in this model is printed on this diagram.

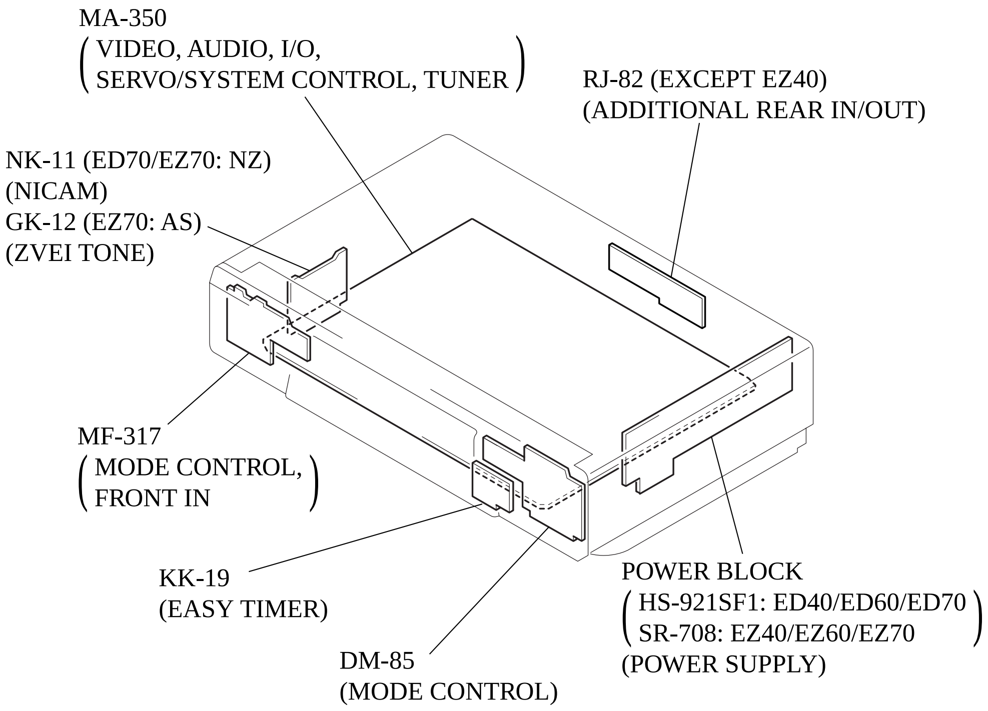

CNJ951:ED40/ED60/ED70/EZ70:AS
LINE-3 IN(SAT IN)
RJ-82 BOARD
VIDEO
L
AUDIO
R
CN954
CN953
CN952
CN951
FL952
C952
C962
C961
IC951
JS956
JS955
C963
R953
JS952
R957
JR951
JR953
CNJ952
CNJ951
R959
JS951
C951
R954
R955
L
R
R956
C960
JS954
R951
JS953
JR954
D951
R958
JS957
R952
FL951
CNJ953
LINE-2 OUT (AUDIO)
D952
05
*1-673-287-
11
(11)
OUT
IN
CNJ953:EZ70:NZ
SAT DEC


1
2
3
4
5
6
7
A
B
C
D
E
RJ-82 BOARD
ED40
MA-350 BOARD(5/9) CN902 (SEE PAGE 4-19)
CN952 4P
SAT IN
AN GND
AU GND
AL3 IN
ED60/ED70/EZ70:AS
MA-350 BOARD(5/9) CN901 (SEE PAGE 4-19)
CN951 10P
SAT IN
AN GND
AU GND
AL3 IN
AU GND
AR3 IN
AU GND
AL OUT
AU GND
AR OUT
EZ60/EZ70:NZ
MA-350 BOARD(5/9) CN903 (SEE PAGE 4-19)
CN953 4P
AU GND
AL OUT
AU GND
AR OUT
EZ70:NZ
MA-350 BOARD(6/9) CN702 (SEE PAGE 4-21)
CN954 5P
DEC OUT
AN GND
DEC IN
AN GND
SW 5V
B+
JL951
JL952
JL953
JL954
JL955
JL956
JL957
JL958
JL959
JL960
JL961
JL962
*D951
02DZ6.2-TPH3:ED40/ED60/ED70/EZ70:AS
0:EZ70:NZ
ED40/ED60/ED70/EZ70:AS
EZ70:AS
ED40/ED60/ED70
R951 68
ED40/ED60/ED70/EZ70:AS
JS951
EXCEPT EZ60
D951
C952 1u 50V
C951 1u 50V
R952 0
FL951
R953 0
JS952
R958 100K
R959 100K
FL952
JS955 0
JS957 0
ED40
EZ70:AS
EXCEPT EZ70:NZ
D952 02DZ6.2-TPH3
EZ70:NZ
CNJ951
VIDEO
L
AUDIO
R
LINE-3 IN (SAT IN)
ED60/ED70/EZ60/EZ70
R954 470
R955 470
CNJ952
L
R
LINE-2 OUT (AUDIO)
IC951 MM1031XML
GND
VIDEO IN
VIDEO OUT
VCC
C961 1u B
R957 68
C960 470u 10V
C962 2.2u
C963 47u 16V
B+
IC951 AMP
CNJ953
OUT
IN
SAT DEC
DEC
R956 68
JS956 0
JS954 0
05

NO MARK:REC/PB MODE

• SIGNAL PATH

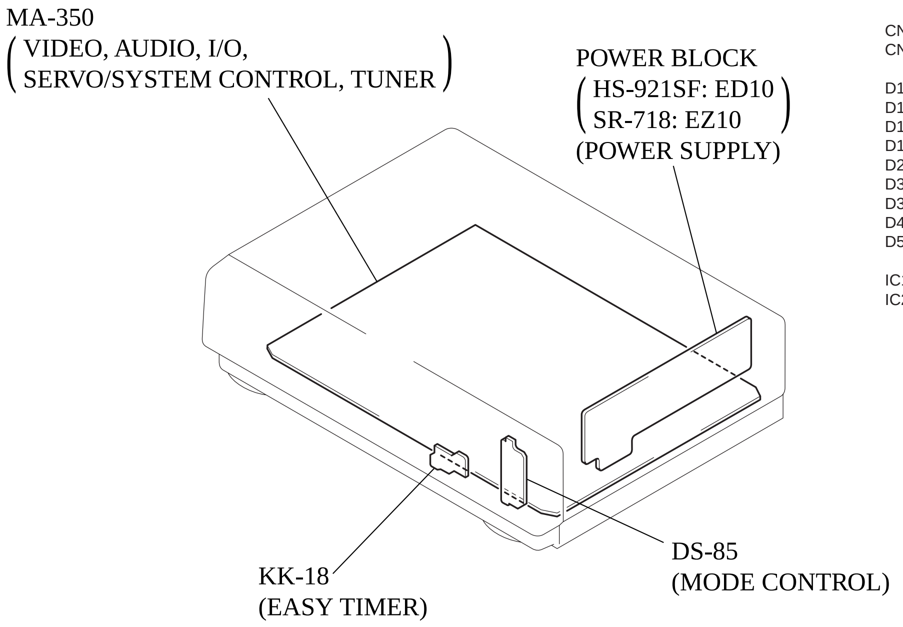
	VIDEO SIGNAL	AUDIO SIGNAL
	Y/CHROMA	
REC	⇛	➡
PB		⇨


MA-350 (VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40) (ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ) (NICAM)
GK-12 (EZ70: AS) (ZVEI TONE)
MF-317 (MODE CONTROL, FRONT IN)
KK-19 (EASY TIMER)
DM-85 (MODE CONTROL)
POWER BLOCK (HS-921SF1: ED40/ED60/ED70 SR-708: EZ40/EZ60/EZ70) (POWER SUPPLY)

HS-921SF/921SF1 (POWER SUPPLY) PRINTED WIRING BOARD

– Ref. No.: HS-921SF/921SF1 board; 3,000 series –

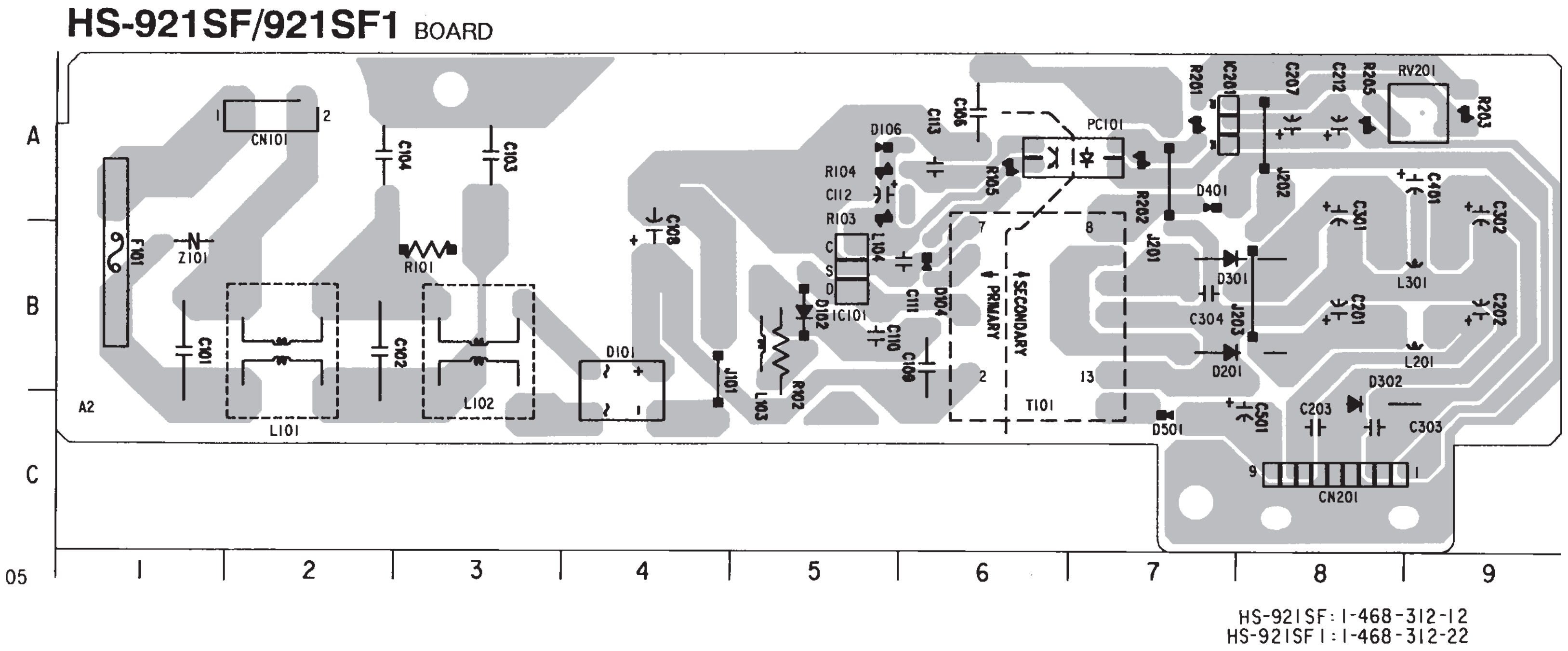
– SLV-ED10/ED40/ED60/ED70 –

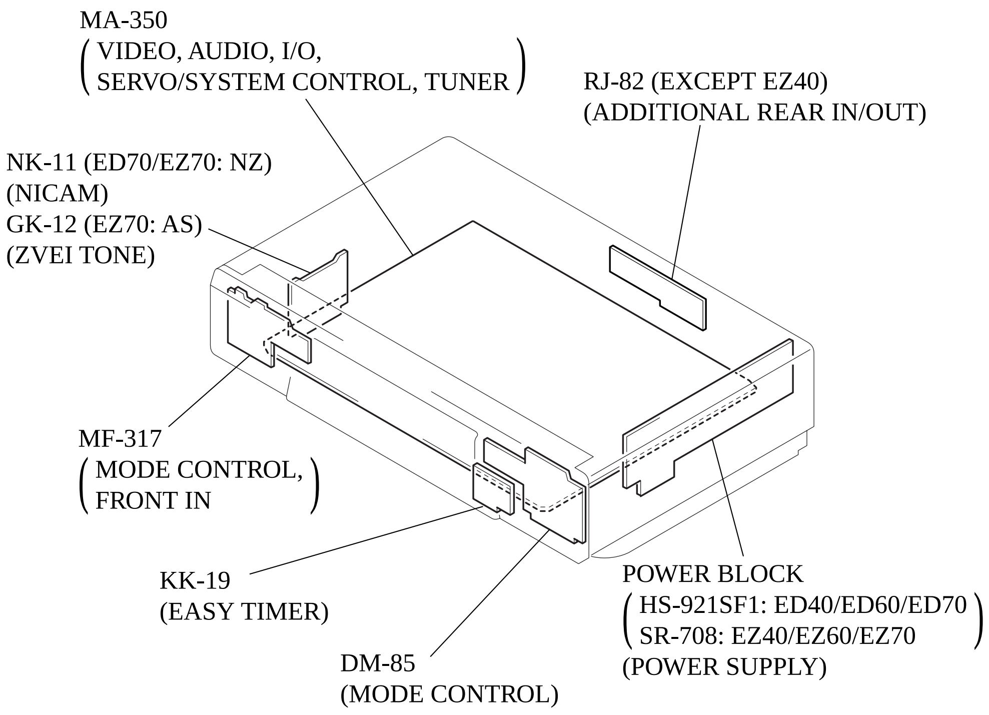

MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
POWER BLOCK
(HS-921SF: ED10
SR-718: EZ10)
(POWER SUPPLY)
KK-18
(EASY TIMER)
DS-85
(MODE CONTROL)

HS-921SF/921SF1 BOARD

CN101	A-2
CN201	C-8
D101	B-4
D102	B-5
D104	B-6
D106	A-5
D201	B-7
D301	B-7
D302	C-8
D401	A-7
D501	C-7
IC101	B-5
IC201	A-7

There are few cases that the part isn't mounted in this model is printed on this diagram.

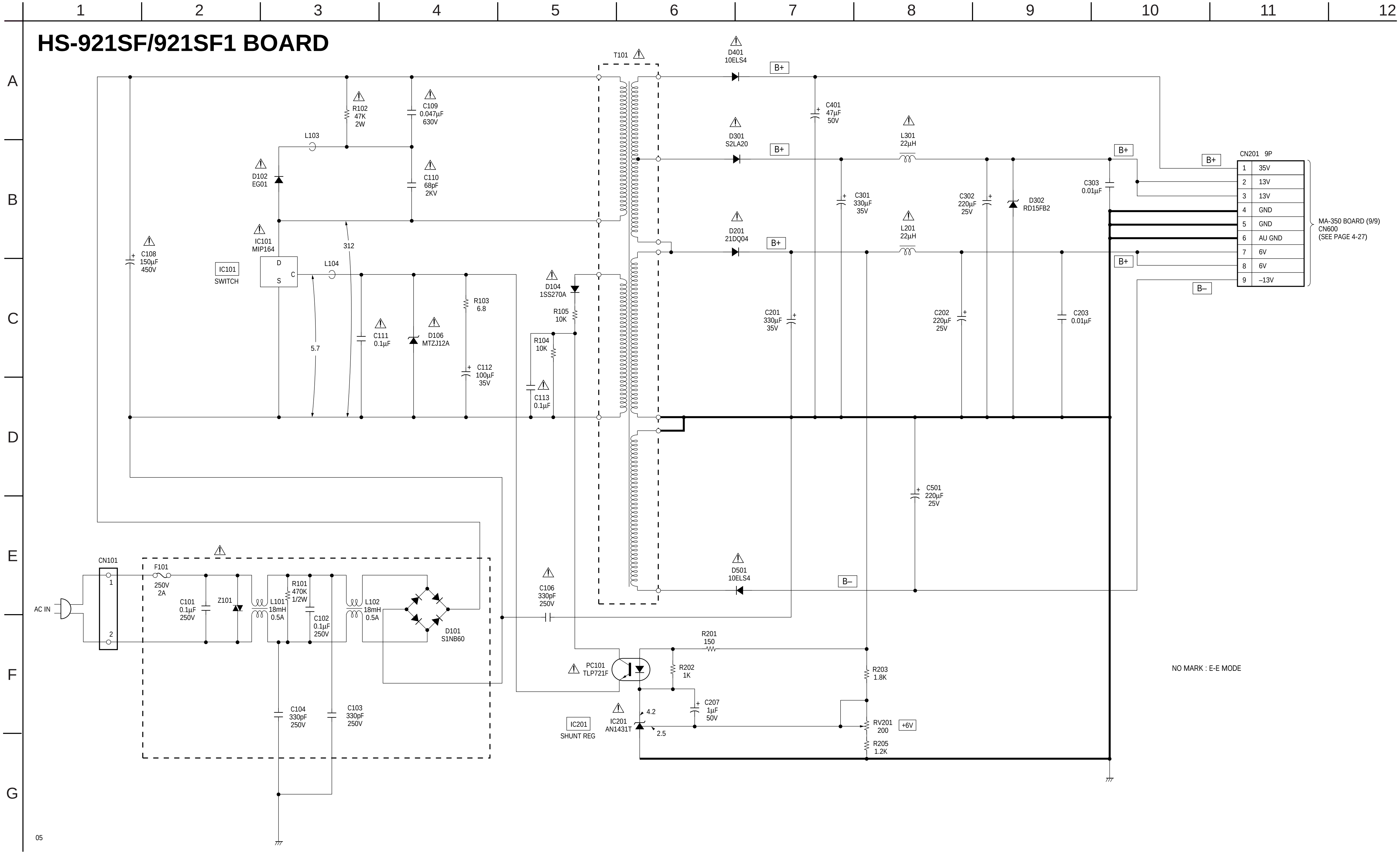

HS-921SF/921SF1 BOARD
A
B
C
05
1
2
3
4
5
6
7
8
9
CN101
F101
Z101
C104
C103
R101
C101
C102
L101
L102
C108
D101
J101
L103
R102
A2
C106
C113
D106
R104
C112
R103
R105
C
S
D
L104
C111
D104
D102
IC101
C110
C109
PC101
SECONDARY
PRIMARY
T101
R202
J201
D401
J202
R201
IC201
C207
C212
R205
RV201
R203
C401
C301
C302
D301
C304
J203
C201
L301
C202
L201
D201
D302
D501
C501
C203
C303
CN201
HS-921SF: 1-468-312-12
HS-921SF1: 1-468-312-22


MA-350
(VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER)
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
(MODE CONTROL,
FRONT IN)
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
(HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70)
(POWER SUPPLY)

HS-921SF/921SF1 (POWER SUPPLY) SCHEMATIC DIAGRAM

– Ref. No.: HS-921SF/921SF1 board; 3,000 series –

– SLV-ED10/ED40/ED60/ED70 –


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
HS-921SF/921SF1 BOARD
T101
D401
10ELS4
B+
R102
47K
2W
C109
0.047µF
630V
L103
C401
47µF
50V
D301
S2LA20
L301
22µH
B+
B+
B+
CN201 9P
D102
EG01
C110
68pF
2KV
C303
0.01µF
C301
330µF
35V
C302
220µF
25V
D302
RD15FB2
1 35V
2 13V
3 13V
4 GND
5 GND
6 AU GND
7 6V
8 6V
9 –13V
MA-350 BOARD (9/9)
CN600
(SEE PAGE 4-27)
IC101
MIP164
312
D201
21DQ04
L201
22µH
B+
B+
B–
C108
150µF
450V
IC101
SWITCH
D
C
S
L104
D104
1SS270A
R103
6.8
R105
10K
C201
330µF
35V
C202
220µF
25V
C203
0.01µF
C111
0.1µF
D106
MTZJ12A
R104
10K
5.7
C112
100µF
35V
C113
0.1µF
C501
220µF
25V
CN101
F101
250V
2A
C106
330pF
250V
D501
10ELS4
B–
AC IN
1
2
C101
0.1µF
250V
Z101
L101
18mH
0.5A
R101
470K
1/2W
C102
0.1µF
250V
L102
18mH
0.5A
D101
S1NB60
R201
150
PC101
TLP721F
R202
1K
R203
1.8K
NO MARK : E-E MODE
C207
1µF
50V
4.2
IC201
SHUNT REG
IC201
AN1431T
2.5
RV201
200
+6V
R205
1.2K
C104
330pF
250V
C103
330pF
250V
05

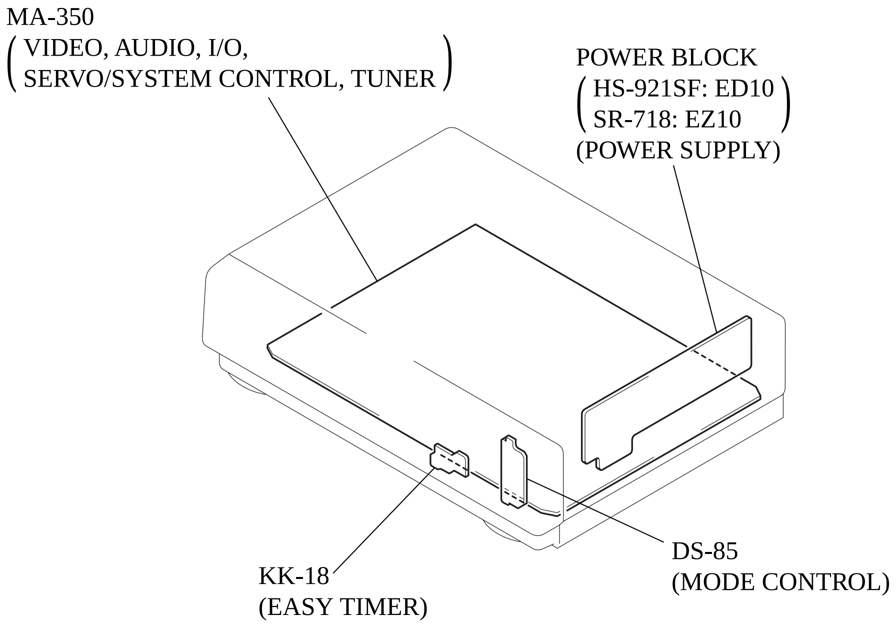
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

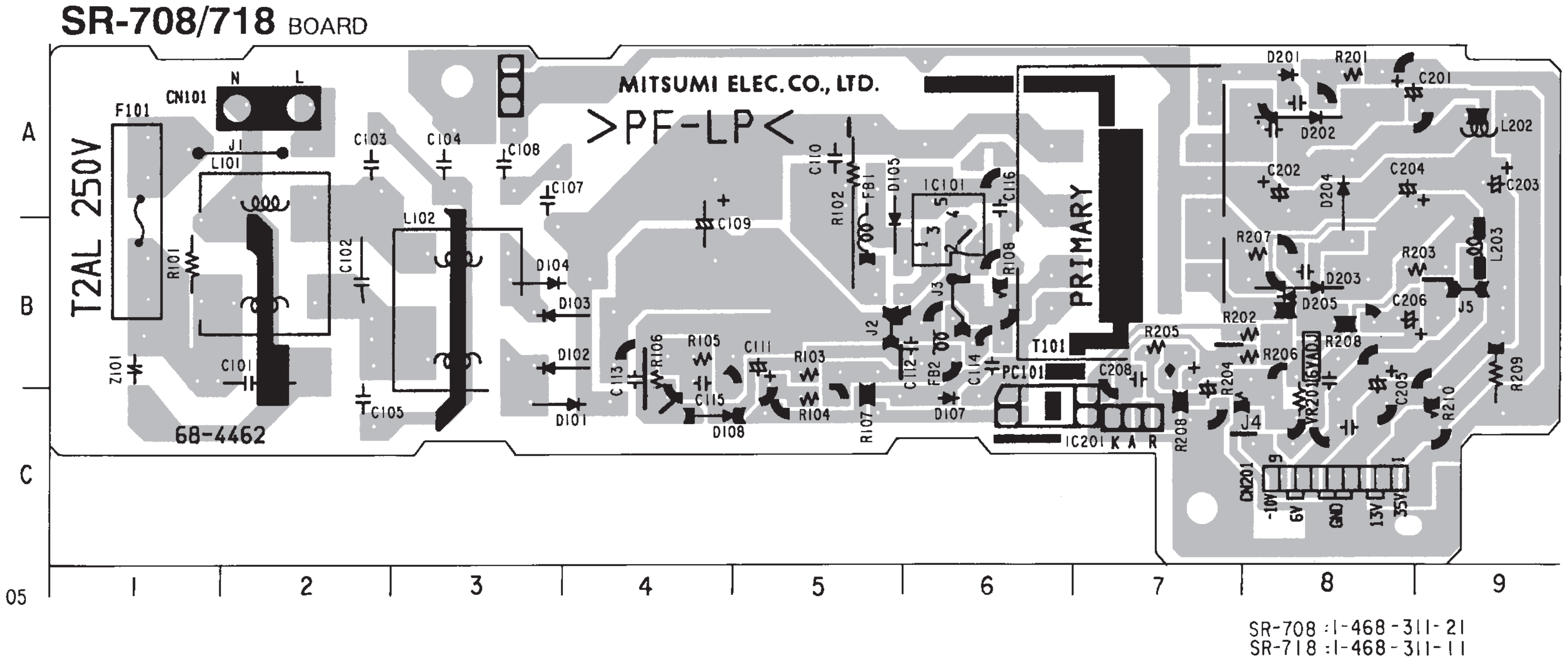
SR-708/718 (POWER SUPPLY) PRINTED WIRING BOARD

– Ref. No.: SR708/718 board; 4,000 series –

– SLV-EZ10/EZ40/EZ60/EZ70 –

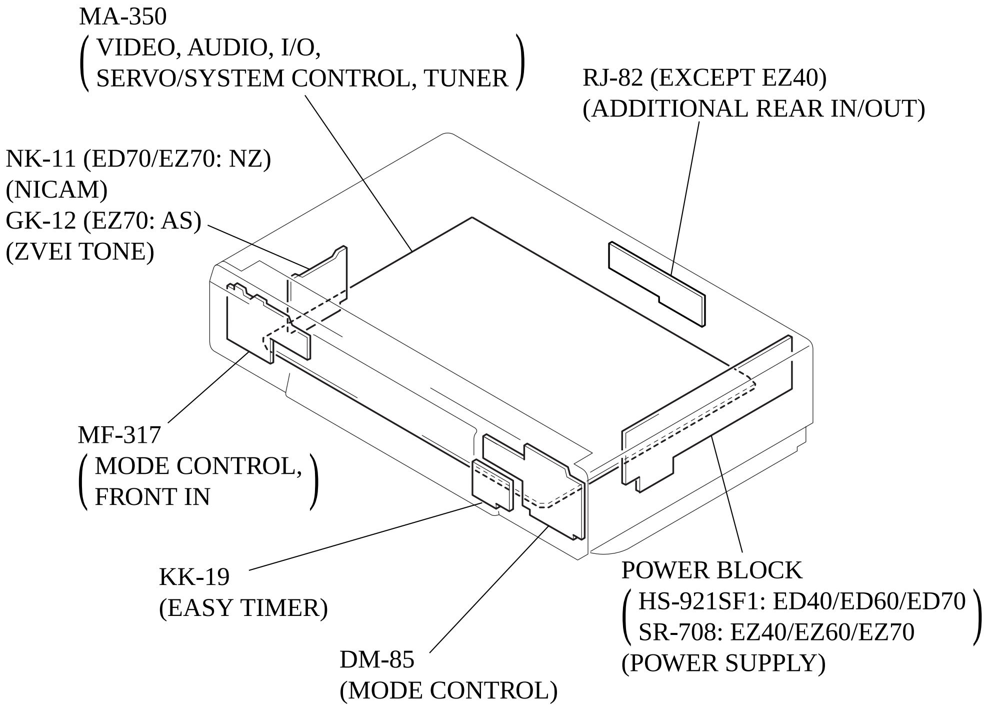
There are few cases that the part isn't mounted in this model is printed on this diagram.


MA-350
VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER
POWER BLOCK
HS-921SF: ED10
SR-718: EZ10
(POWER SUPPLY)
KK-18
(EASY TIMER)
DS-85
(MODE CONTROL)


SR-708/718 BOARD
MITSUMI ELEC. CO., LTD.
>PF-LP<
PRIMARY
T2AL 250V
68-4462
F101
CN101
N
L
J1
L101
L102
R101
Z101
C101
C102
C103
C104
C105
C107
C108
C109
C110
C111
C112
C113
C114
C115
C116
D101
D102
D103
D104
D105
D107
D108
FB1
FB2
IC101
IC201
K A R
PC101
J2
J3
J4
J5
R102
R103
R104
R105
R106
R107
R108
T101
D201
D202
D203
D204
D205
R201
R202
R203
R204
R205
R206
R207
R208
R209
R210
C201
C202
C203
C204
C205
C206
C208
L202
L203
CN201
-10V
6V
GND
13V
35V
A
B
C
05
1
2
3
4
5
6
7
8
9
SR-708 :1-468-311-21
SR-718 :1-468-311-11

SR-708/718 BOARD

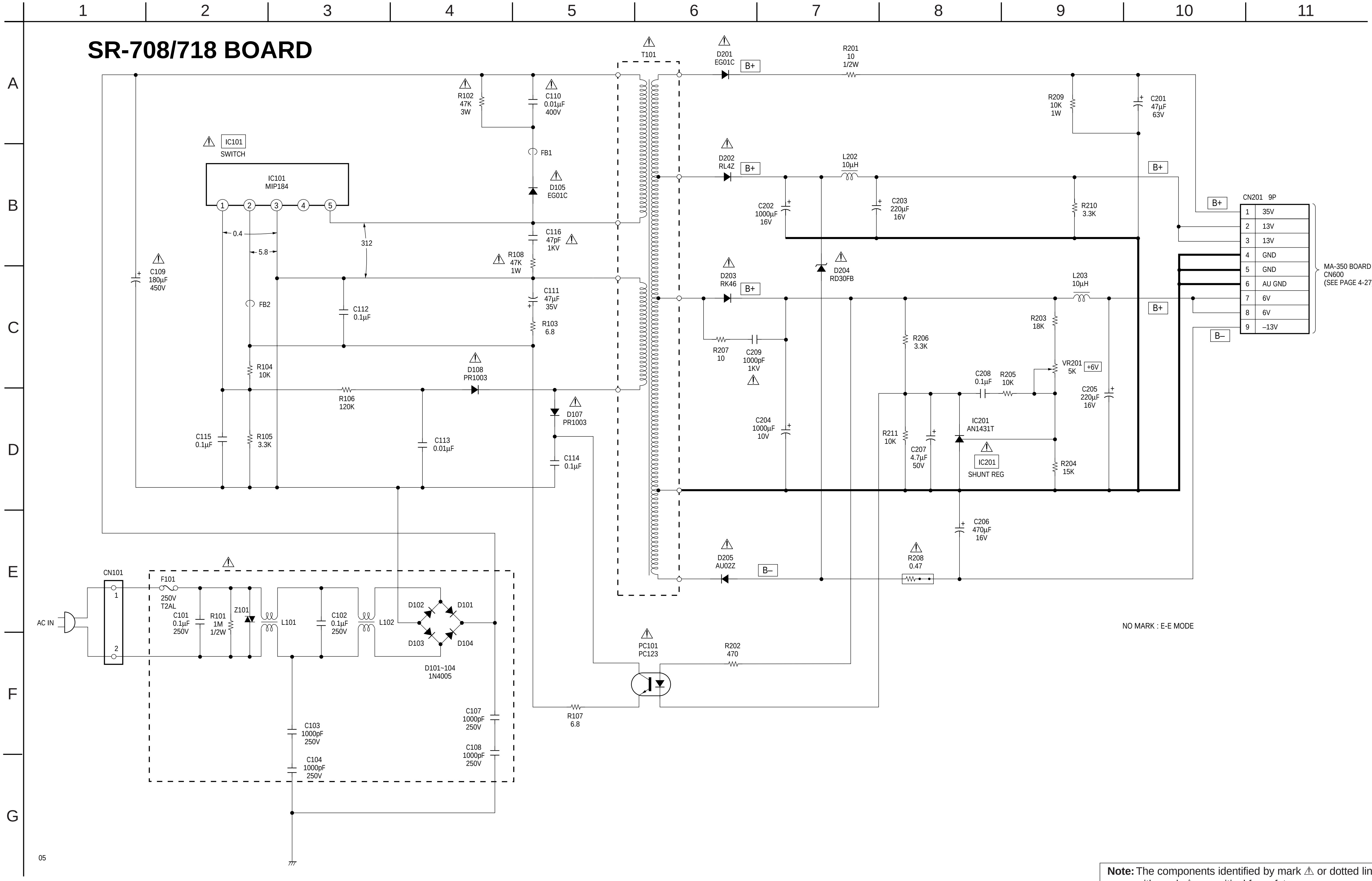
CN101	A-2
CN201	C-8
D101	C-3
D102	B-3
D103	B-3
D104	B-3
D105	B-5
D107	C-6
D108	C-4
D201	A-8
D202	A-8
D203	B-8
D204	A-8
D205	B-8
IC101	B-6
IC201	C-7


MA-350
VIDEO, AUDIO, I/O,
SERVO/SYSTEM CONTROL, TUNER
RJ-82 (EXCEPT EZ40)
(ADDITIONAL REAR IN/OUT)
NK-11 (ED70/EZ70: NZ)
(NICAM)
GK-12 (EZ70: AS)
(ZVEI TONE)
MF-317
MODE CONTROL,
FRONT IN
KK-19
(EASY TIMER)
DM-85
(MODE CONTROL)
POWER BLOCK
HS-921SF1: ED40/ED60/ED70
SR-708: EZ40/EZ60/EZ70
(POWER SUPPLY)

SR-708/718 (POWER SUPPLY) SCHEMATIC DIAGRAMS

– Ref. No.: SR-708/718 board; 4,000 series –

– SLV-EZ10/EZ40/EZ60/EZ70 –


1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
SR-708/718 BOARD
T101
D201 EG01C
B+
R201 10 1/2W
R102 47K 3W
C110 0.01µF 400V
R209 10K 1W
C201 47µF 63V
IC101 SWITCH
IC101 MIP184
1 2 3 4 5
FB1
D105 EG01C
D202 RL4Z
L202 10µH
C202 1000µF 16V
C203 220µF 16V
R210 3.3K
CN201 9P
1 35V
2 13V
3 13V
4 GND
5 GND
6 AU GND
7 6V
8 6V
9 –13V
MA-350 BOARD (9/9) CN600 (SEE PAGE 4-27)
0.4
5.8
312
C116 47pF 1KV
R108 47K 1W
C109 180µF 450V
D204 RD30FB
D203 RK46
L203 10µH
C111 47µF 35V
C112 0.1µF
FB2
R103 6.8
R203 18K
B–
R207 10
C209 1000pF 1KV
R206 3.3K
R104 10K
D108 PR1003
VR201 5K
+6V
C208 0.1µF
R205 10K
C205 220µF 16V
R106 120K
D107 PR1003
C204 1000µF 10V
IC201 AN1431T
R211 10K
C207 4.7µF 50V
C115 0.1µF
R105 3.3K
C113 0.01µF
C114 0.1µF
IC201 SHUNT REG
R204 15K
C206 470µF 16V
D205 AU02Z
R208 0.47
CN101
F101 250V T2AL
AC IN
C101 0.1µF 250V
R101 1M 1/2W
Z101
L101
C102 0.1µF 250V
L102
D102
D101
D103
D104
D101~104 1N4005
NO MARK : E-E MODE
PC101 PC123
R202 470
R107 6.8
C107 1000pF 250V
C103 1000pF 250V
C108 1000pF 250V
C104 1000pF 250V
05

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

SECTION 5
INTERFACE, IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-350 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
RF SWP	MA-350 IC161㉔	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	MA-350 IC161㉗	O	L	L	L	*2	*3	*3	*3	*3	*3	L	L
C SYNC	MA-350 IC161(54)	I	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4

*1. 25 Hz pulse with 50% duty cycle. Synchronized with rotation of drum.
*2. Normal PB "L". V period "H" pulse when ×1.
*3. V period "H" pulse.
*4. Composite sync signal (positive polarity).

5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-350 BOARD IC161)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
CAP QR	MA-350 IC161(94)	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*2	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z
DRUM PG	MA-350 IC161㊴	I	*3	*1	*1	*4	*4	*1	*1	*1	*1	*1	*1	*1	*1
DRUM FG	MA-350 IC161㊳	I	*3	*6	*6	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6
CAP FG	MA-350 IC161㊵	I	H/L	*5	*5	*4	*4	*5	H/L	*5	*5	*5	*5	*5	H/L
CAP VS	MA-350 IC161㉕	O	*7	*7	*7	*7	*7	*8	*7	*7	*8	*8	*8	*8	*7
DRUM VS	MA-350 IC161㉖	O	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9

*1. 25 Hz (PAL), 30 Hz (NTSC) pulse.
*2. Pulse at tape running.
*3. "L" when drum rotation stop.
*4. Unstable period pulse.
*5. Pulse of period in proportion to tape speed.
*6. 300 Hz (PAL), 360 Hz (NTSC) pulse.
*7. Pulse at tape running.
*8. Approx. 2 msec period "H" or "L" pulse.
*9. Approx. 1.5 msec period "H" or "L" pulse.

5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-350 BOARD IC161)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREAD-ING	TAPE UNTHREAD-ING	STOP	FF	REW	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
CAM	MA-350 IC161(83)	O	Hi-Z	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1	MA-350 IC161(84)	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2	MA-350 IC161(85)	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3	MA-350 IC161(86)	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4	MA-350 IC161(87)	I	L	H	H	*1	*1	L	H	H	L	L	L	L	L	L	L	L
REC PRF	MA-350 IC161(55)	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL	MA-350 IC161(88)	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL	MA-350 IC161(89)	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
END-LED	MA-350 IC161(74)	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
$\overline{\text{CAP RVS}}$	MA-350 IC161(93)	I	L			H	L	H/L	H	L	H	H	H	H	H	L	H	H
T SENS	MA-350 IC161⑫	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	MA-350 IC161⑪	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainty.
*2. "L" when erasing protection tab is bent, "H" when not bent.
*3. Pulse of period in proportion to reel rotating speed.
*4. Approx. 2 msec period "H" pulse.
*5. Pulse at tape running.
*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction: L.
When transition to LOADING direction: H.
When CAM motor is stopped: Hi-Z.

5-4. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-350 BOARD IC161)

Signal	Pin No.	I/O	STOP/ FF/ REW	TAPE THREAD-ING	TAPE UNTHREAD-ING	PB	PB • PAUSE	SLOW	× 2	CUE	REVIEW	REC	REC • PAUSE
AU RF	MA-350 IC161⑭	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	MA-350 IC161(79)	O (O.D)	Hi-Z	Hi-Z	Hi-Z	Hi-Z	H	H	H	H	H	L	L
AF REC P	MA-350 IC161(60)	O	H	H	H	H	H	H	H	H	H	L	H
AF SWP	MA-350 IC161㉓	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
$\overline{\text{FULL ERASE}}$	MA-350 IC161(91)	O (O.D)	H	H	H	H	H	H	H	H	H	L	H
AF REC	MA-350 IC161(59)	O	L	L	L	L	L	L	L	L	L	H	H
REC P	MA-350 IC161(92)	O	L	L	L	L	L	L	L	L	L	H	L
NAPB	MA-350 IC161㉑	O	L	L	L	L	L	L	L	L	L	H	L

*1. 25 Hz (PAL), 30 Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SW P.

5-5. SERVO/SYSTEM/TIMER/TUNER/MODE CONTROL, OSD MICROPROCESSOR PIN FUNCTION (MA-350 BOARD IC161)

Pin No.	Pin Name	I/O	Function
1	SW1	O	Tuner system control-1 signal output
2	AN GND	–	Analog ground
3	APC ERROR	I	APC error voltage signal input
4	DMS UP	I	Click shuttle forward/reverse signal input (DMS models only)
5	FUNC. KEY2	I	Function key analog voltage signal input
6	TU AFT	I	Auto fine tuning signal input
7	FUNC. KEY1	I	Function key analog voltage signal input
8	POWER FAIL	I	Power failure detect signal input
9	DMS DOWN	I	Click shuttle forward/reverse signal input (DMS models only)
10	DEST	I	Destination set signal input
11	S SENS	I	Supply end sensor signal input
12	T SENS	I	Take up end sensor signal input
13	VIDEO RF	I	Video RF envelop signal input
14	AU RF	I	Hi-Fi audio envelop signal input
15	AN 5V	–	Power supply analog 5V
16	RESET	I	Reset signal input
17	3.58/4.43	O	NTSC color freq. judge signal output
18	PAL	O	“H”: PAL (video block control signal output)
19	ETR1	I	Easy timer knob pulse-1 signal input
20	ETR2	I	Easy timer knob pulse-2 signal input
21	NAPB	O	Normal audio PB signal output
22	VCC	–	Power supply unswitch 5V
23	AF SWP	O	AF switching pulse signal output
24	RF SWP	O	RF switching pulse signal output
25	CAP VS	O	Capstan error signal output
26	DRUM VS	O	Drum motor error signal output
27	QVD	O	Quasi VD pulse signal output
28	N.C.	–	Not used
29	H.AMPSW	O	“H”: A-DUB mode (CTL amp. gain control signal output)
30	N.C.	–	Not used
31	CTL (+)	I/O	CTL head signal input/output (REC mode)
32	CTL (-)	I/O	CTL head signal input/output (REC mode)
33	VSS (SERVO)	–	Servo ground
34	CTL-AMP1	I	CTL amp. control signal input (gain set)
35	CTL-AMP2	I	CTL amp. control signal input (gain set)
36	CTL-AMP3	I	CTL amp. control signal input (gain set)
37	CTL-AMP OUT	O	CTL amp. control signal output (for check)
38	DRUM FG	I	Drum FG schmitt amp. input
39	DRUM PG	I	Drum PG schmitt amp. input
40	CAP FG	I	Capstan FG schmitt input
41	VCC (SERVO)	–	Power supply unswitch 5V
42	VCC (OSD)	–	Power supply OSD 5V
43	CV IN	I	Composite video signal input
44	VREF	I	Reference bias and clamp bias power signal input
45	CV OUT	O	Composite video signal output
46	N.C.	–	Not used
47	AFC LPF	I	AFC LPF signal input
48	AFC OSC	I	AFC oscillation signal input
49	VSS (OSD)	–	OSD ground
50	DOSC-IN	I	OSC dot clock oscillator signal input
51	DOSC-OUT	O	OSC dot clock oscillator signal output
52	4FSC-OUT	O	OSC 4fsc oscillator terminal signal output
53	4FSC-IN	I	OSC 4fsc oscillator terminal signal input
54	CSYNC	I	Composite sync signal input
55	REC PRF	I	Erasing protection tab. cassette in detection signal input
56	IIC DATA	O	EEP ROM, Hi-Fi IC, tuner/serial communication data signal output
57	IIC CLOCK	O	EEP ROM, Hi-Fi IC, tuner/serial communication clock signal output
58	DRUM QR	O	Drum motor step driving signal output
59	AF REC	O	“H”: output when Hi-Fi audio REC
60	AF REC P	O	“L”: output when Hi-Fi audio REC pause
61	N.C.	–	Not used
62	IIC CLOCK (VIDEO)	O	Video, video amp. serial communication clock signal output
63	IIC DATA (VIDEO)	O	Video, video amp. serial communication data signal output
64	BLUE BACK	O	OSD block control signal output
65	APC PWM	O	APC PWM signal output
66	CAP TRQ PWM	O	Capstan TRQ PWM signal output
67	N.C.	–	Not used
68	TEST	I	Fixed to ground
69	32kHz-IN	I	Timer clock terminal (32kHz) input
70	32kHz-OUT	O	Timer clock terminal (32kHz) output
71	VSS	–	Ground
72	10MHz-IN	I	System clock terminal (10MHz) input
73	10MHz-OUT	O	System clock terminal (10MHz) output
74	END-LED	O	Top/end LED on/off control signal output
75	POWER CONT	O	Power supply control signal output
76	N.C.	–	Not used
77	N.C.	–	Not used
78	OSD SEL	O	OSD XÅftal select (PAL/NTSC) signal output
79	A MUTE	O	“H”: audio mute signal output
80	WRITE CONT	O	EEP ROM write timing control signal output
81	IN SEL	O	Line-input selection control signal output
82	REMOCON	I	Remote control (SIRCS) signal input
83	CAM	O	CAM motor control signal output
84	MODE1	I	Mechanism section CAM encoder data 1 input
85	MODE2	I	Mechanism section CAM encoder data 2 input
86	MODE3	I	Mechanism section CAM encoder data 3 input
87	MODE4	I	Mechanism section CAM encoder data 4 input
88	T REEL	I	T side reel FG input
89	S REEL	I	S side reel FG input
90	$\overline{\text{FLD CS}}$	O	FIP driver chip select signal output
91	$\overline{\text{FULL ERASE}}$	O	Full erase head on/off control signal output
92	$\overline{\text{REC P}}$	O	“L”: output when REC pause
93	$\overline{\text{CAP RVS}}$	O	Capstan reverse control signal “H”: when reverse
94	CAP QR	O	Capstan step driving signal output
95	S CLOCK	O	Serial communication clock signal output
96	S IN	I	Serial communication data signal input
97	S OUT	O	Serial communication data signal output
98	PLL CLOCK	O	Tuner PLL clock signal output
99	TU ENABLE	O	Tuner PLL chip select signal output
100	PLL DATA	O	Tuner PLL data signal output

5-6. NICAM PROCESSOR PIN FUNCTION (NK-11 BOARD IC1)

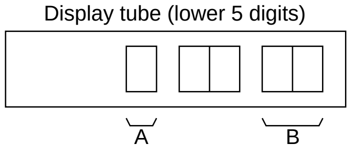
Pin. No.	Pin Name	I/O	Function
1	OUT L	O	Analog signal output left
2	OUT R	O	Analog signal output right
3	VDD A1	–	Analog power supply 5V; DAC circuitry
4	VSS A1	–	Analog ground; DAC circuitry
5	VSS D1	–	Digital ground; DAC circuitry
6	VDD D1	–	Digital power supply 5V; DAC circuitry
7	VSS D2	–	Digital ground; DSP part
8	VDD D2	–	Digital power supply 5V; DSP part
9	TP2	I	Additional test pin 2; connected to ground for normal operation
10	N.C.	–	Not used
11	TP1	I	Additional test pin 1; connected to ground for normal operation
12	N.C.	–	Not used
13	N.C.	–	Not used
14	V TUNE	O	Tuning voltage output for crystal oscillator
15	XTAL I	I	Crystal oscillator input
16	XTAL O	O	Crystal oscillator output
17	TEST2	I	Test pin 2; connected to ground for normal operation
18	I REF	I	Resistor for reference current generation; front end circuitry
19	N.C.	–	Not used
20	VSS A2	–	Analog ground; analog front end circuitry
21	VDD A2	–	Analog power supply 5V; analog front end circuitry
22	TEST1	I	Test pin 1; connected to ground for normal operation
23	SIF2	I	Sound IF input 2
24	V REF1	I	Reference voltage; analog front end circuitry
25	SIF1	I	Sound IF input 1
26	C RST		Capacitor for power-on reset
27	VSS D3	–	Digital ground; front end circuitry
28	VDD D3	–	Digital power supply 5V; front end circuitry
29	SCL	I	Serial communication clock signal input
30	SDA	I	Serial communication data signal input
31	N.C.	–	Not used
32	N.C.	–	Not used
33	N.C.	–	Not used
34	N.C.	–	Not used
35	VDD D4	–	Digital power supply 5V; demodulator circuitry
36	VSS D4	–	Digital ground; demodulator circuitry
37	N.C.	–	Not used
38	N.C.	–	Not used
39	EXTI R	I	External audio input right channel
40	EXTI L	I	External audio input left channel
41	V REF2	I	Analog reference voltage digital-to-analog converter and operational amplifiers
42	N.C.	–	Not used
43	VDD A3	–	Analog power supply 5V; operational amplifiers
44	VSS A3	–	Analog ground; operational amplifiers

5-7. ZWEITON PROCESSOR PIN FUNCTION (GK-12 BOARD IC001)

Pin. No.	Pin Name	I/O	Function
1	OUT L	O	Audio left signal output
2	OUT R	O	Audio right signal output
3	CDE1	–	De-emphasis 1 capacitor
4	N.C.	–	Not used
5	N.C.	–	Not used
6	CDE2	–	De-emphasis 2 capacitor
7	A GND	–	Analog ground
8	AF1 I	I	Audio 1 signal input
9	N.C.	–	Not used
10	AF1 O	O	Audio 1 signal output
11	N.C.	–	Not used
12	N.C.	–	Not used
13	AFR	I	AF 1/2 signal return
14	LF1	–	Loop filter 1
15	XTAL	I	4MHz reference input
16	N.C.	–	Not used
17	N.C.	–	Not used
18	LF2	–	Loop filter 2
19	N.C.	–	Not used
20	N.C.	–	Not used
21	MAD	I	Programmable address bit (module address)
22	N.C.	–	Not used
23	N.C.	–	Not used
24	CAF1	O	AF1 capacitor
25	IF INT	I	IF intercarrier input
26	CAF2	O	AF2 capacitor
27	D GND	–	Digital ground
28	VCC	–	Power supply 5V
29	SCL	I	Serial communication clock input
30	SDA	I/O	Serial communication data input and output
31	LPF	–	Pilot loop filter
32	AF2 O	O	Audio 2 signal output
33	AF2 I	I	Audio 2 signal input
34	CTR IG	–	Trigger capacitor
35	CID	–	Identification capacitor
36	N.C.	–	Not used
37	P1	O	Output port 1
38	EXT M	I	External audio input monaural channel
39	EXTI R	I	External audio input right channel
40	EXTI L	I	External audio input left channel
41	V REF	I	Analog reference voltage digital-to-analog converter and operational amplifiers
42	P2	O	Output port 2
43	OUT M	O	Audio monaural signal output
44	N.C.	–	Not used

SECTION 6
ERROR CODES

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error.
The following provides description concerned.



A: Error code .... Table 6-1
B: Mode code in case of error .... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.
In this case, " : " between digits is not displayed.

Table 6-1. Error Codes

Code	Description
0	NO ERROR
1	CAM ENCODER ERROR, LOAD DIRECTION
2	CAM ENCODER ERROR, UNLOAD DIRECTION
3	T REEL ERROR
4	S REEL ERROR
5	CAPSTAN ERROR
6	DRUM ERROR
7	INITIALIZE ERROR
8	CASSETTE UNLOADING ERROR
9	RESERVED

Table 6-2. Mode Codes in Case of Error

Code	Description
0	EJECT (POWER ON)
1	EJECT (POWER OFF)
2	UNLOAD STOP
3	STOP (POWER ON)
4	POWER OFF (CASSETTE IN)
5	F. FWD
6	REW
7	LOW SPEED F. FWD
8	LOW SPEED REW
9	STANDBY
10	REC
11	REC (VISS)
12	REC PAUSE
13	PLAY
14	A. DUB
15	A. DUB PAUSE
16	CUE
17	REV
18	STILL (MECHA FWD)
19	FWD FRAME BY FRAME (FWD SLOW)
20	STILL (MECHA RVS)
21	RVS FRAME BY FRAME (RVS SLOW)

SECTION 7
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustments on Page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used

1) Color TV
2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
3) NTSC pattern generator
4) PAL pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio noise meter
8) Audio generator
9) Attenuator
10) Alignment tape
    Part Code: 8-192-605-36 KRV-51P (PAL)
    Part Code: 8-192-605-32 KRV-51N2 (NTSC)

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

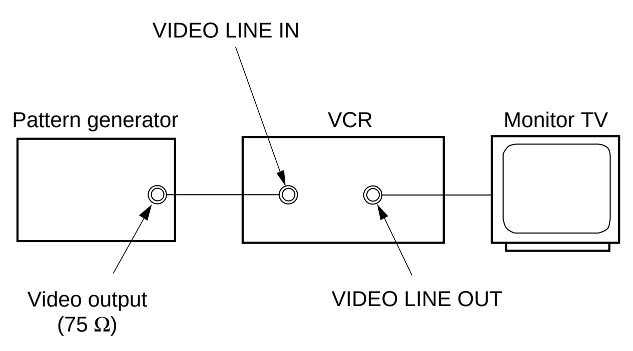

VIDEO LINE IN
Pattern generator
VCR
Monitor TV
Video output (75 Ω)
VIDEO LINE OUT

Fig. 7-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL or NTSC pattern generator is connected with LINE input signal terminal. When checking with tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and “red” signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

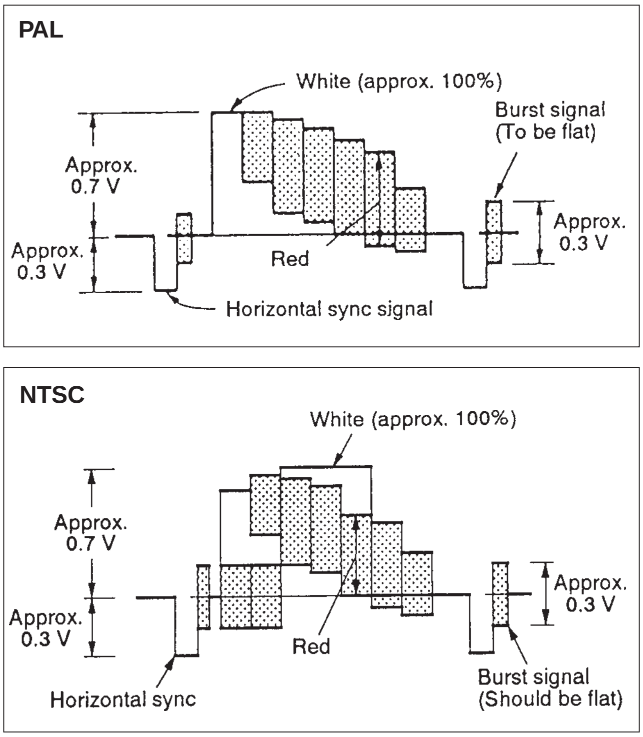

PAL
White (approx. 100%)
Burst signal (To be flat)
Approx. 0.7 V
Approx. 0.3 V
Red
Approx. 0.3 V
Horizontal sync signal
NTSC
White (approx. 100%)
Approx. 0.7 V
Approx. 0.3 V
Approx. 0.3 V
Red
Horizontal sync
Burst signal (Should be flat)

Fig. 7-2-2

2-1-4. Alignment Tapes
[Alignment Tape (KRV-51N2/KRV-51P)]

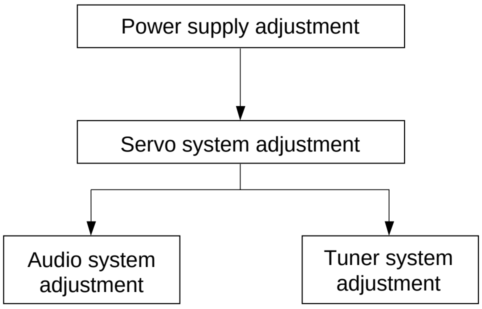
	Mode	Time	Video signal	Audio signal (HiFi/Normal)
1	SP	Seven minutes	Color bar	400 Hz
2	SP	Three minutes	Monoscope	
3	EP	Seven minutes	Color bar	
4	EP	Three minutes	Monoscope	

2-1-5. Specified I/O Level and Impedance
Input/output terminal

Video inputs	LINE IN : phono jack 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio inputs	LINE IN : phono jacks 47 kW, –7.5 dBs (0 dBs = 0.775 Vrms) More than 10 kW, –4 dBs
Video outputs	LINE OUT: phono jack 1 Vp-p, 75 Ω, unbalanced, sync negative
Audio outputs	LINE OUT: phono jacks –7.5 dBs at load impedance 47 kΩ Output impedance : less than 10 Ω

2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.


Power supply adjustment
Servo system adjustment
Audio system adjustment
Tuner system adjustment

2-2. POWER SUPPLY ADJUSTMENTS

2-2-1. Power Supply Check (HS-921SF/921SF1 BOARD, SR-708/718 BOARD)

Mode	E-E
Measuring Instrument	Digital voltmeter
–10 V check	
Measurement Point	Pin ⑨ of CN201
Specified Value	–9.5 ±0.8 V
+6 V check	
Measurement Point	Pin ⑦, ⑧ of CN201
Specified Value	5.9 ± 0.2 V
+13 V check	
Measurement Point	Pin ②, ③ of CN201
Specified Value	13.8 ± 1.2 V
+35 V check	
Measurement Point	Pin ① of CN201
Specified Value	35.0 ± 3.0 V

Checking Method:

1) Confirm that each voltage meets its specified value.

2-2-2. +6 V Adjustment (HS-921SF/921SF1 BOARD, SR-708/718 BOARD)

Mode	REC or PB
Measuring Instrument	Digital voltmeter
Measurement Point	Pin ⑦, ⑧ of CN201
Adjusting Element	RV201 (HS-921SF/921SF1 BOARD) VR201 (SR-708/718 BOARD)
Specified Value	5.9 ± 0.2 V

2-3. SERVO SYSTEM ADJUSTMENT

2-3-1. RF Switching Position Adjustment (MA-350 BOARD)

Purpose:

Adjust the interval between A ch and B ch of tape playback output.

Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement Point	CH1: Pin ② of CN203 CH2: Pin ③ of CN203 (RF SWP)
Measuring Instrument	Oscilloscope
Specified Value	6.5 ± 0.5 H (416 ± 32 µsec) PAL 6.5 ± 0.5 H (410 ± 32 µsec) NTSC

Adjusting Method:

1) Connect MA-350 board JS450 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Check appear “A P” on FL display.
3) Using the channel + and – buttons, adjust to 6.5 ± 0.5 H.
4) Press the pause button.

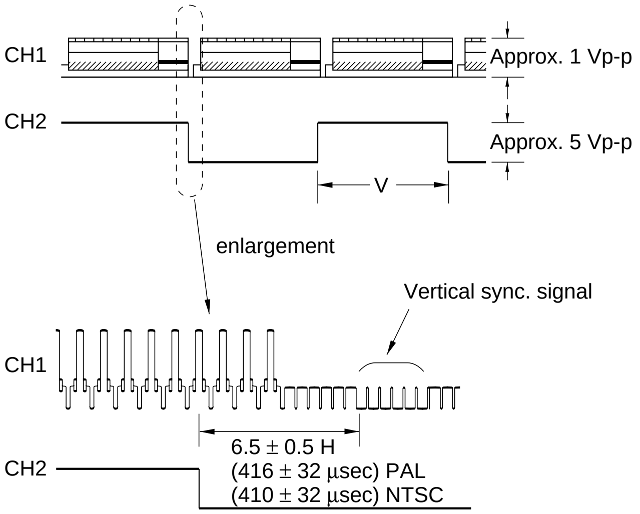

CH1
CH2
Approx. 1 Vp-p
Approx. 5 Vp-p
V
enlargement
Vertical sync. signal
CH1
CH2
6.5 ± 0.5 H
(416 ± 32 µsec) PAL
(410 ± 32 µsec) NTSC

Fig. 7-2-3.

2-4. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

[Connection]

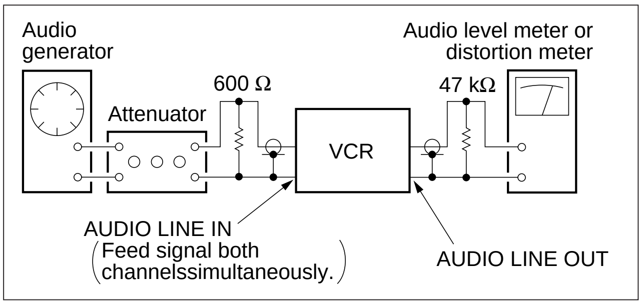

Audio generator
Audio level meter or distortion meter
600 Ω
47 kΩ
Attenuator
VCR
AUDIO LINE IN
(Feed signal both channelssimultaneously.)
AUDIO LINE OUT

Fig. 7-2-4.

2-4-1. Hi-Fi Audio System Adjustment (SLV-ED60/ED70/EZ60/EZ70)

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.
  INPUT SELECT switch .... LINE
  AUDIO MONITOR .... STEREO

[Adjustment Sequence]

1. **AF Switching Position Adjustment**
2. **Frequency Response Check**
3. **Overall Level Characteristic and Distortion Factor Check**
4. **Overall S/N Check**

1. AF Switching Position Adjustment (MA-350 BOARD)

Purpose:
Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets. When it is out of order, noisy sound is increased and big noise is heard.

Mode	PB
Signal	Alignment tape SP mode color bar
Measurement point	CH1: Pin ③ of CN203 CH2: Pin ① of CN203
Measuring Instrument	Oscilloscope
Specified Value	Fig. 7-2-5

Adjusting Method:

1) Connect MA-350 board JS450 to the GND for about 1 second to activate the RF switching position adjustment mode.
2) Press the record button to activate the AF switching position adjustment mode.
3) Check appear “A H” on FL display.
4) Using the channels + and – buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
5) Press the pause button.

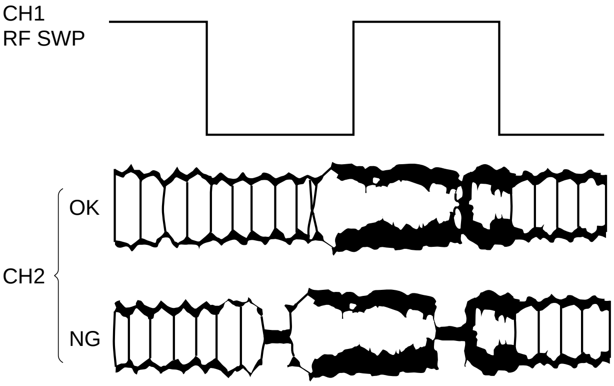


Fig. 7-2-5.

2. Frequency Response Check

Purpose:
Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP, LP mode)
Signal	400 Hz, –7.5 dBs 20 Hz, –7.5 dBs 20 kHz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	0 ± 2 dB

Note: Tape path adjustment must have been completed.

Confirmation Method:

1) Supply a signal of 400 Hz, –7.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –7.5 dBs.
4) Make recording.
5) Set an audio line input signal to 20 Hz and make recording.
6) Set an audio line input signal to 20 kHz and make recording.
7) Playback a recorded portion, and measure output levels at 400 Hz and 20 Hz and 20 kHz.
8) Confirm that the 20 Hz and 20 kHz playback output level within a range of the 400 Hz playback output level 0 ± 2 dB.

3. Overall Level Characteristic and Distortion Factor Check

Purpose:
Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 2.0 dBs Distortion factor: 1% or less

Confirmation Method:
1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ±2.0 dBs.
5) Confirm that a distortion factor is within 1%.

4. Overall S/N Check

Purpose:
Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–67.5 dBs or less

Confirmation Method:
1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –67.5 dBs.

2-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

[Adjustment Sequence]
1. **ACE Head Adjustment**
2. **E-E Output Level Check**
3. **Frequency Response Check**
4. **Overall Level Characteristic and Distortion Factor Check**
5. **Overall S/N Check**

1. ACE Head Adjustment

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

2. E-E Output Level Check (SLV-ED10/ED40/EZ10/EZ40)

Purpose:
Confirm that the output level against the reference input is within the specification.

Mode	E-E
Signal	L, R: 400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	–7.5 ± 3.0 dBs

Confirmation Method:
1) Simultaneously input a signal of 400 Hz, –7.5 dBs to both L and R channels of Audio Line Input.
2) Confirm that the audio output level is –7.5 ± 3.0 dBs.
(This level only can appear with mono models)

3. Frequency Response Check

Purpose:
Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –17.5 dBs 7 kHz, –17.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Specified value	2.5 ± 4.0 dB

Tape path adjustment must have been completed.

Confirmation Method:
1) Supply a signal of 400 Hz, –17.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –17.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 2.5 ± 4.0 dB.

4. Overall Level Characteristic and Distortion Factor Check

Purpose:

Check the record level, play level, and distortion factor against the reference input.

Mode	REC and PB (SP mode)
Signal	400 Hz, –7.5 dBs
Measurement point	Audio output terminal
Measurement equipment	Audio level meter and distortion factor meter
Specified value	Playback level: –7.5 ± 4.0 dBs Distortion factor: 4% or less

Confirmation Method:

1) Supply an audio signal of 400 Hz, –7.5 dBs simultaneously to both L and R channels of Audio Line Input.
2) Make recording
3) Play back a recorded portion.
4) Confirm that a playback level is –7.5 ± 4.0 dBs.
5) Confirm that a distortion factor is within 4%.

5. Overall S/N Check

Purpose:

Confirm that the S/N is within the specification.

Mode	REC and PB (SP mode)
Signal	Short
Measurement point	Audio output terminal
Measurement equipment	Audio noise meter
Specified value	–46.0 dBs or less

Confirmation Method:

1) Connect both L and R channels of audio line input to the GND.
2) Start recording.
3) Play the recorded part to confirm that the noise is below –46.0 dBs.

2-5. TUNER SYSTEM ADJUSTMENT

[Connection]

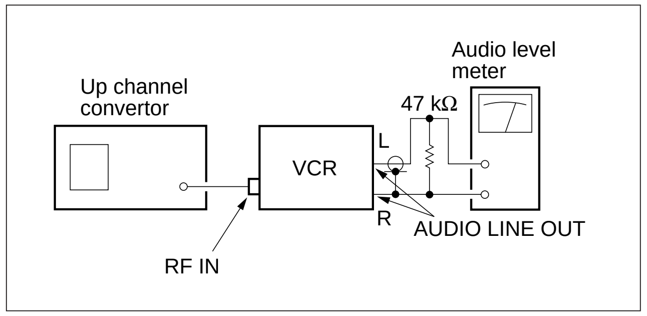


Fig. 7-2-6

2-5-1. Separation Adjustment (SLV-EZ70:AS)

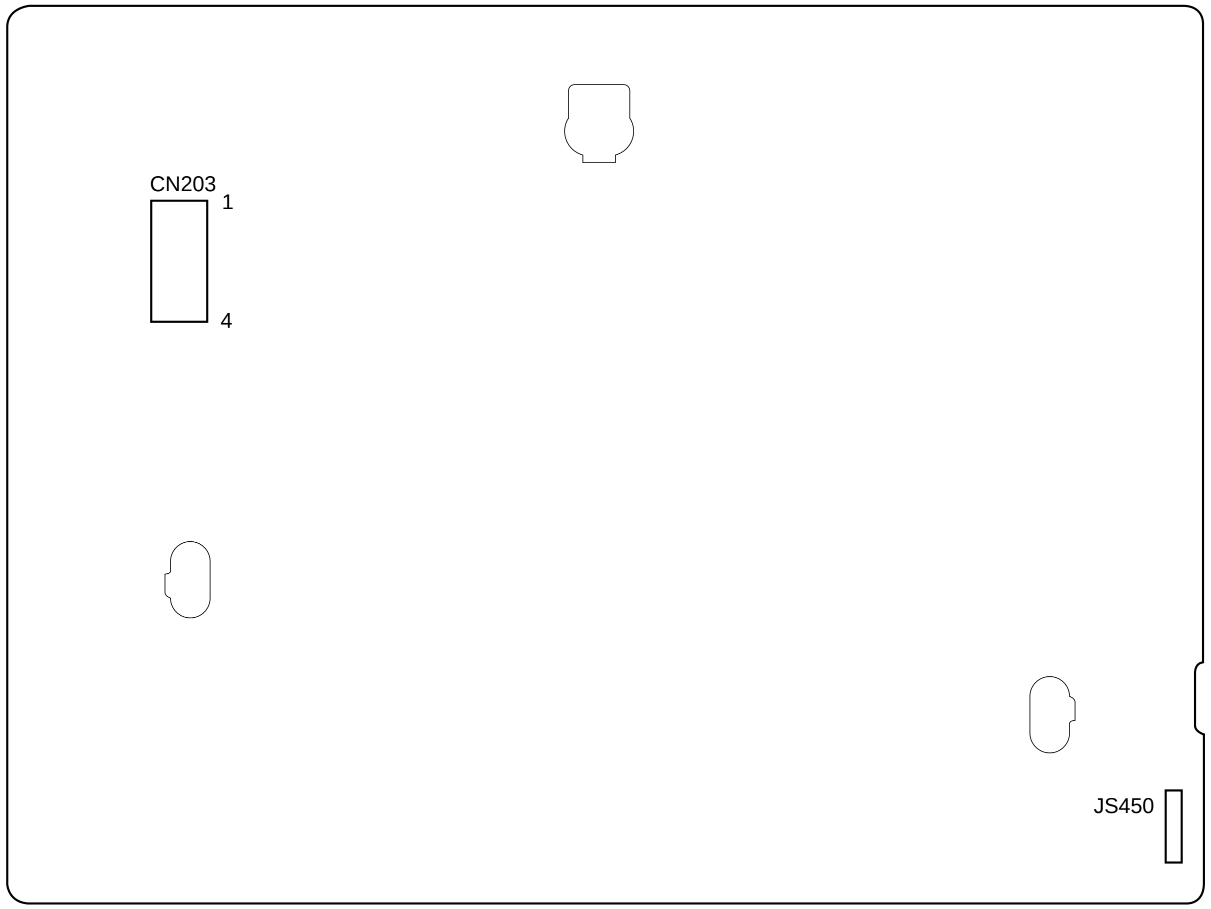
Purpose:

Mixed audio signal separate Lch and Rch.

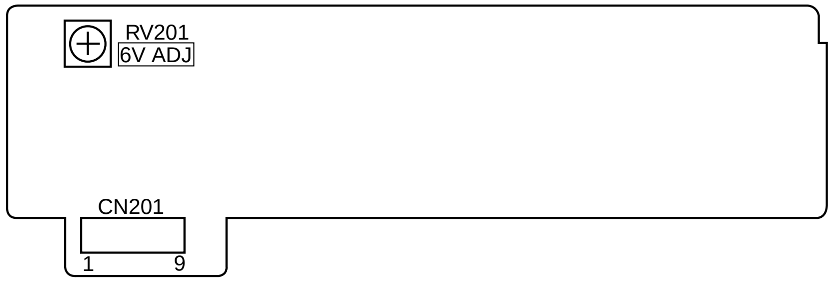
Mode	E-E
Signal	VIDEO: color bar (White 100% modulation) AUDIO: L NONE R 1 kHz 60% modulation ELECTRIC FIELD: 60–80 dBs/75 Ω Term
Measurement point	Audio output terminal
Measurement equipment	Audio level meter
Adjusting Element	RV001
Specified value	minimum

2-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

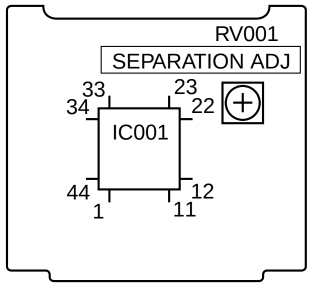
MA-350 BOARD (Side A)



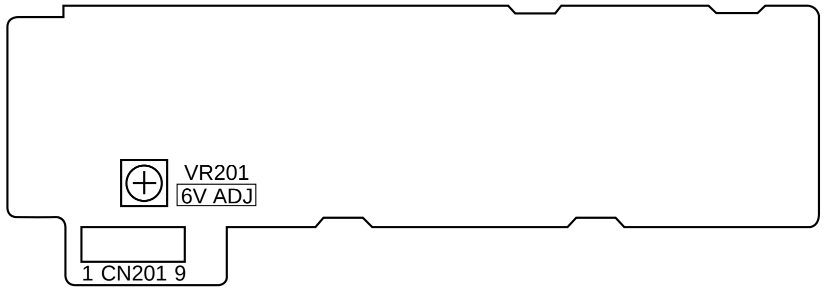
HS-921SF/921SF1 BOARD (Side A)



GK-12 BOARD (Side A)



SR-708/718 BOARD (Side A)



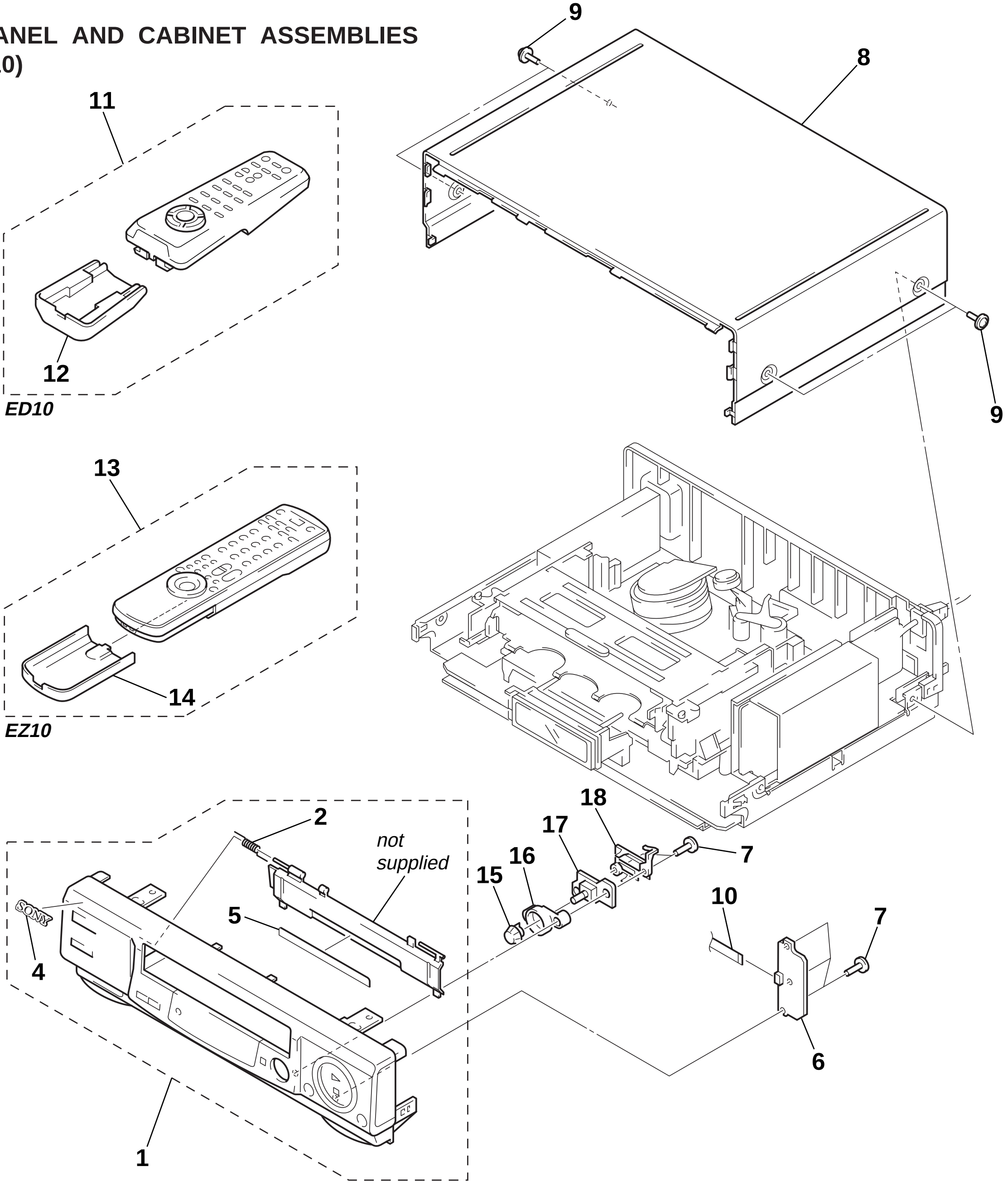
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

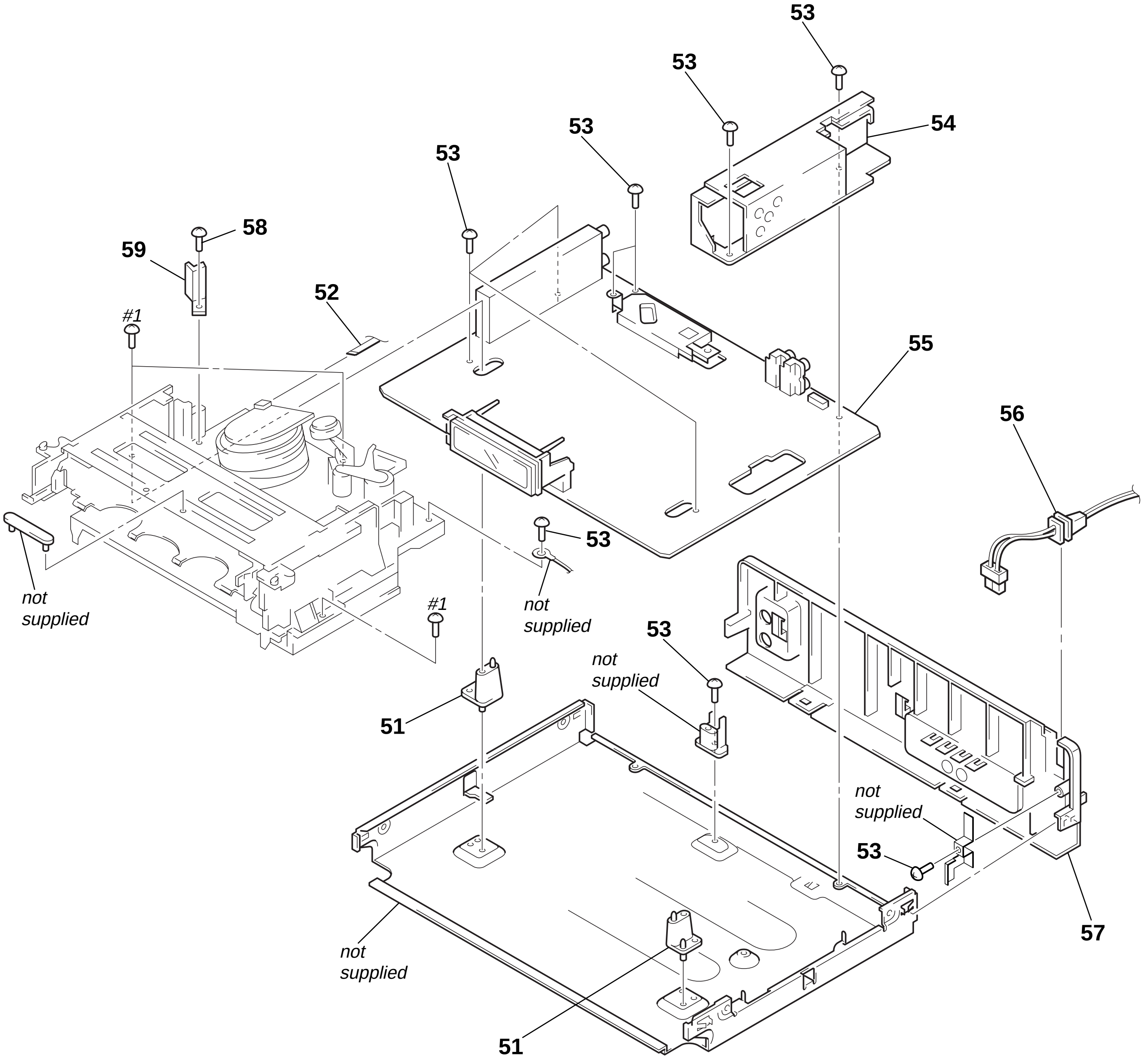
NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of the electrical parts list.

8-1-1. FRONT PANEL AND CABINET ASSEMBLIES (ED10/EZ10)



Ref. No.	Part No.	Description	Remark
1	X-3949-480-1	PANEL ASSY, FRONT (ED10:ME,PS,SG)	
1	X-3949-482-1	PANEL ASSY, FRONT (EZ10)	
1	X-3949-550-1	PANEL ASSY, FRONT (ED10: MPS)	
2	3-953-432-01	SPRING (GE), FL	
4	3-943-995-01	EMBLEM (NO.5), SONY	(ED10: ME, PS, SG/EZ10)
4	3-943-995-31	EMBLEM (NO.5), SONY (ED10: MPS)	
5	3-053-240-21	PLATE, DOOR ORNAMENTAL	
* 6	A-6796-662-A	DS-85 BOARD, COMPLETE	
7	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
8	3-053-078-41	CASE, UPPER (ED10: ME, PS, SG/EZ10)	
8	3-053-078-31	CASE, UPPER (ED10: MPS)	
9	3-710-901-01	SCREW, TAPPING (ED10: MPS)	
9	3-710-901-11	SCREW, TAPPING (ED10: ME, PS, SG/EZ10)	
10	1-790-537-11	CABLE, FLAT (FFC) (FDS-5)	
11	1-418-160-11	COMMANDER, STANDARD (RMT-V248C)	(ED10)
12	3-709-322-01	COVER, BATTERY (for RMT-V248C) (ED10)	
13	1-475-614-21	COMMANDER, STANDARD (RMT-V245A)	(EZ10)
14	3-709-128-01	COVER, BATTERY (for RMT-V245A) (EZ10)	
15	3-054-386-01	KNOB, ETR	
16	3-054-384-01	ESCUTCHEON, ETR	
* 17	A-6796-661-A	KK-18 BOARD, COMPLETE	
18	3-054-385-01	HOLDER, ETR	

8-1-2. CHASSIS ASSEMBLY (ED10/EZ10)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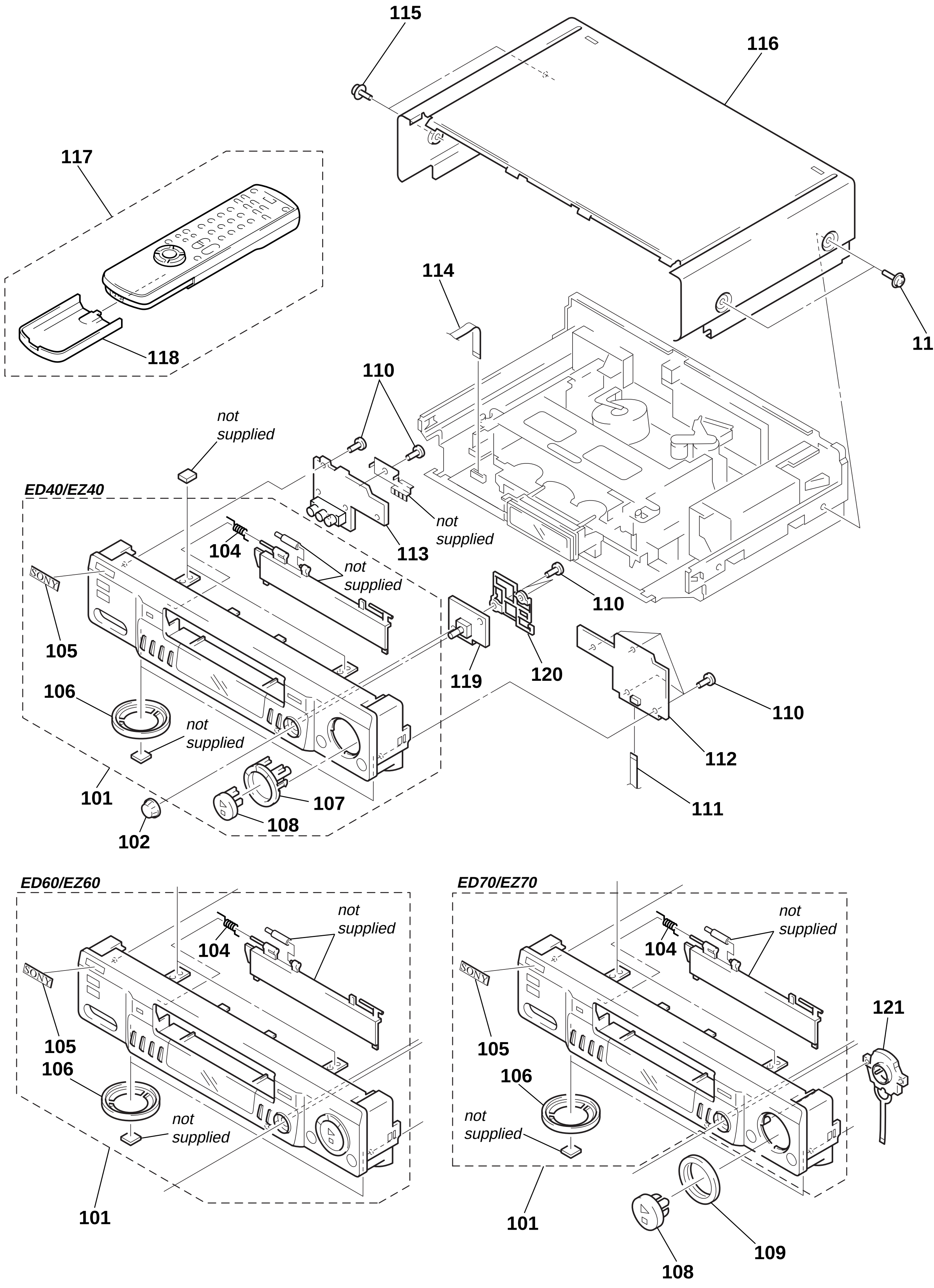
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	3-959-383-02	BASE (R), MD	
52	1-790-536-11	CABLE, FLAT(FFC) (FMD-13)	
53	3-970-608-21	SUMITITE (B3), +BV	
54	1-468-311-11	POWER BLOCK (SR-718) (EZ10)	
54	1-468-312-12	POWER BLOCK (HS-921SF) (ED10)	
* 55	A-6796-660-A	MA-350 BOARD, COMPLETE (ED10: PS, MPS)	
* 55	A-6796-663-A	MA-350 BOARD, COMPLETE (EZ10)	

Ref. No.	Part No.	Description	Remark
* 55	A-6796-664-A	MA-350 BOARD, COMPLETE (ED10: ME, SG)	
⚠56	1-777-854-21	CORD, POWER (ED10)	
⚠56	1-777-855-22	CORD, POWER (EZ10)	
* 57	3-979-652-51	PANEL (M), REAR (EZ10)	
* 57	3-979-652-61	PANEL (M), REAR (ED10)	
58	3-979-112-01	SCREW SW (+) BVTP 3X10	
59	X-3947-568-1	TC (N17S) ASSY	

8-1-3. FRONT PANEL AND CABINET ASSEMBLIES
(ED40/ED60/ED70/EZ40/EZ60/EZ70)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102
108
107
112
111
ED60/EZ60
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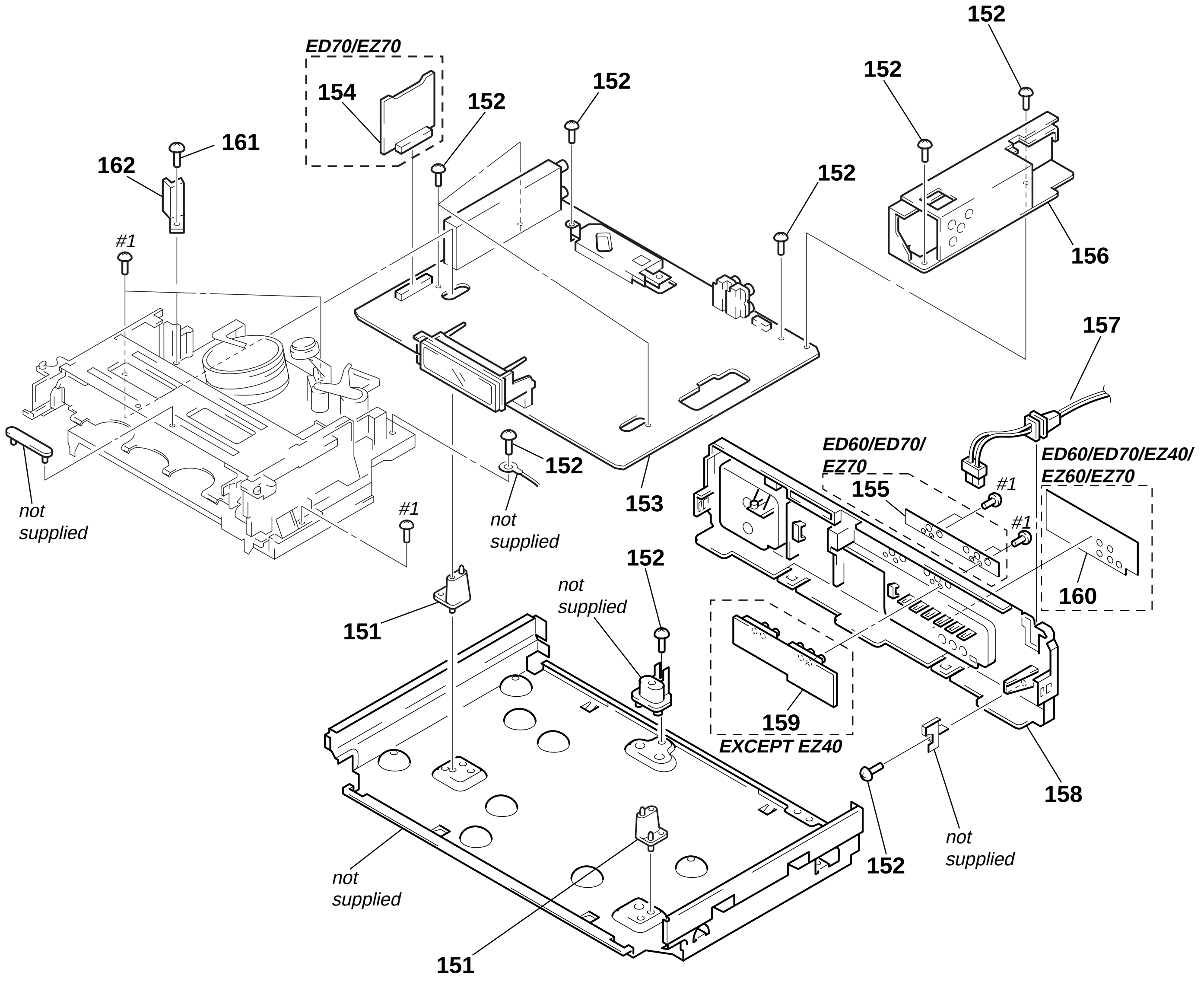
104
105
106
not supplied
101
ED70/EZ70
not supplied
104
121
105
106
not supplied
101
109
108

Ref. No.	Part No.	Description	Remark
101	X-3949-341-1	PANEL, ASSY FRONT (EZ40)	
101	X-3949-342-1	PANEL, ASSY FRONT (ED40)	
101	X-3949-343-1	PANEL, ASSY FRONT (ED60)	
101	X-3949-344-1	PANEL, ASSY FRONT (EZ60)	
101	X-3949-345-1	PANEL, ASSY FRONT (ED70)	
101	X-3949-346-1	PANEL, ASSY FRONT (EZ70: AS)	
101	X-3949-347-1	PANEL, ASSY FRONT (EZ70: NZ)	
102	3-052-763-01	KNOB, ETR (P5) (EXCEPT ED40/EZ40)	
102	3-052-763-11	KNOB, ETR (P5) (ED40/EZ40)	
104	3-953-432-01	SPRING (GE), FL	
105	3-943-995-01	EMBLEM (NO.5), SONY (ED40/EZ40)	
105	3-943-995-31	EMBLEM (NO.5), SONY (EXCEPT ED40/EZ40)	
* 106	3-977-160-01	INSULATOR	
107	3-987-816-01	RING, BUTTON (ED40/EZ40)	
108	3-972-518-11	BUTTON, CENTER (ED40/EZ40)	
108	3-979-309-61	BUTTON (AV), CENTER (ED70/EZ70)	
109	3-988-327-21	RING (M), JOG (ED70/EZ70)	
110	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
111	1-790-533-11	CABLE, FLAT (FFC) (FDM-6)	
* 112	A-6791-859-A	DM-85 BOARD, COMPLETE (EXCEPT ED70/EZ70)	
* 112	A-6791-873-A	DM-85 BOARD, COMPLETE (ED70/EZ70)	
* 113	A-6791-860-A	MF-317 BOARD, COMPLETE (ED60)	
* 113	A-6791-865-A	MF-317 BOARD, COMPLETE (EZ40/EZ60)	
* 113	A-6791-868-A	MF-317 BOARD, COMPLETE (ED40)	
* 113	A-6791-874-A	MF-317 BOARD, COMPLETE (ED70)	
* 113	A-6791-877-A	MF-317 BOARD, COMPLETE (EZ70)	
114	1-790-534-11	CABLE, FLAT (FFC) (FMF-36) (ED60/EZ40/EZ60)	
114	1-790-535-11	CABLE, FLAT (FFC) (FMF-33) (ED40/ED70/EZ70)	
115	3-710-901-01	SCREW, TAPPING (EXCEPT ED40/EZ40)	
115	3-710-901-11	SCREW, TAPPING (ED40/EZ40)	
116	3-979-313-61	CASE, UPPER (EXCEPT ED40/EZ40)	
116	3-979-313-81	CASE, UPPER (ED40/EZ40)	
117	1-418-159-11	COMMANDER, STANDARD (RMT-V245C) (EZ60)	
117	1-418-161-11	COMMANDER, STANDARD (RMT-V247C) (ED60)	
117	1-418-161-21	COMMANDER, STANDARD (RMT-V247D) (ED70)	
117	1-475-614-11	COMMANDER, STANDARD (RMT-V245) (EZ70)	
117	1-475-614-21	COMMANDER, STANDARD (RMT-V245A) (EZ40)	
117	1-475-616-11	COMMANDER, STANDARD (RMT-V247) (ED40)	
118	3-709-128-01	COVER, BATTERY (for RMT-V245/V245A/V245C) (EZ40/EZ60/EZ70)	
118	3-709-133-11	COVER, BATTERY (for RMT-V247/V245C/V247D) (ED40/ED60/ED70)	
* 119	A-6791-861-A	KK-19 BOARD, COMPLETE	
120	3-052-765-01	HOLDER, ETR (P5)	
121	1-762-844-21	SWITCH, ROTARY (ED70/EZ70)	

8-1-4. CHASSIS ASSEMBLY (ED40/ED60/ED70/EZ40/EZ60/EZ70)


ED70/EZ70
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EZ70
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159
EXCEPT EZ40
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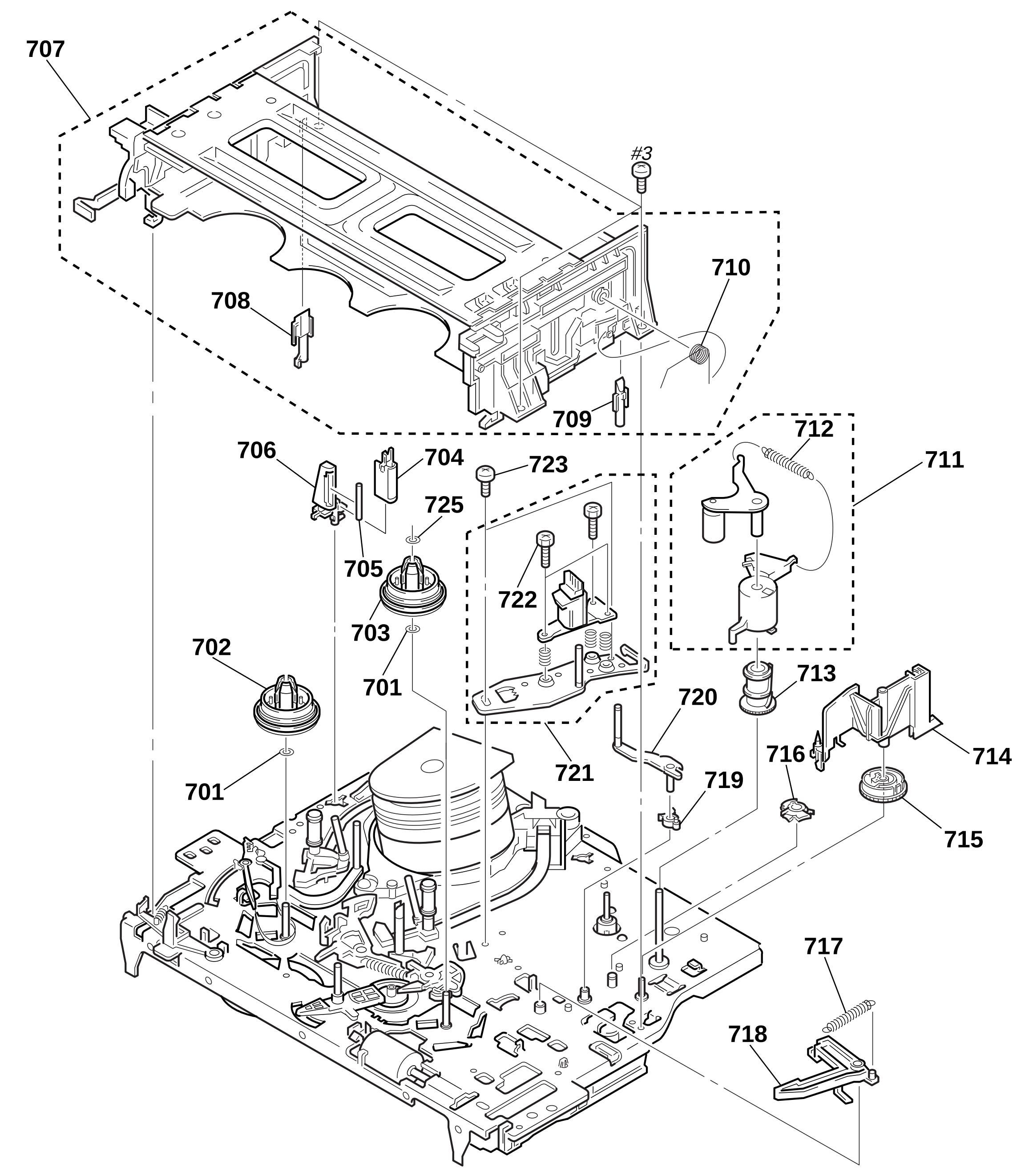
151

The components identified by mark ⚠or dotted line with mark ⚠are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 151	3-959-383-02	BASE (R), MD	
152	3-970-608-21	SUMITITE (B3), +BV	
* 153	A-6791-857-A	MA-350 BOARD, COMPLETE (ED60: PS)	
* 153	A-6791-862-A	MA-350 BOARD, COMPLETE (ED60: ME, SG)	
* 153	A-6791-863-A	MA-350 BOARD, COMPLETE (EZ60)	
* 153	A-6791-866-A	MA-350 BOARD, COMPLETE (ED40: PS)	
* 153	A-6791-869-A	MA-350 BOARD, COMPLETE (ED40: ME, SG)	
* 153	A-6791-870-A	MA-350 BOARD, COMPLETE (EZ40)	
* 153	A-6791-872-A	MA-350 BOARD, COMPLETE (ED70)	
* 153	A-6791-875-A	MA-350 BOARD, COMPLETE (EZ70: AS)	
* 153	A-6791-878-A	MA-350 BOARD, COMPLETE (EZ70: NZ)	
* 154	A-6791-591-A	NK-11 BOARD, COMPLETE (ED70/EZ70: NZ)	
* 154	A-6791-880-A	GK-12 BOARD, COMPLETE (EZ70: AS)	
155	3-987-913-42	PLATE, REAR JACK B (ED60/ED70/EZ70: AS)	
155	3-987-913-62	PLATE, REAR JACK B (EZ70: NZ)	
156	1-468-311-21	POWER BLOCK (SR-708) (EZ40/EZ60/EZ70)	

Ref. No.	Part No.	Description	Remark
156	1-468-312-22	POWER BLOCK (HS-921SF1) (ED40/ED60/ED70)	
⚠157	1-777-854-21	CORD, POWER (ED40/ED60/ED70)	
⚠157	1-777-855-22	CORD, POWER (EZ40/EZ60/EZ70)	
* 158	3-977-139-51	PANEL, REAR (EXCEPT EZ40)	
* 158	3-977-139-61	PANEL, REAR (EZ40)	
* 159	A-6791-858-A	RJ-82 BOARD, COMPLETE (ED60/ED70)	
* 159	A-6791-864-A	RJ-82 BOARD, COMPLETE (EZ60)	
* 159	A-6791-867-A	RJ-82 BOARD, COMPLETE (ED40)	
* 159	A-6791-876-A	RJ-82 BOARD, COMPLETE (EZ70: AS)	
* 159	A-6791-879-A	RJ-82 BOARD, COMPLETE (EZ70: NZ)	
160	3-987-912-61	PLATE, REAR JACK A (ED60/ED70/EZ70)	
160	3-987-912-31	PLATE, REAR JACK A (EZ40)	
160	3-987-912-71	PLATE, REAR JACK A (EZ60)	
161	3-979-112-01	SCREW SW (+) BVTP 3X10	
162	X-3947-568-1	TC (N17S) ASSY	

8-1-5. MECHANISM CHASSIS ASSEMBLY (1)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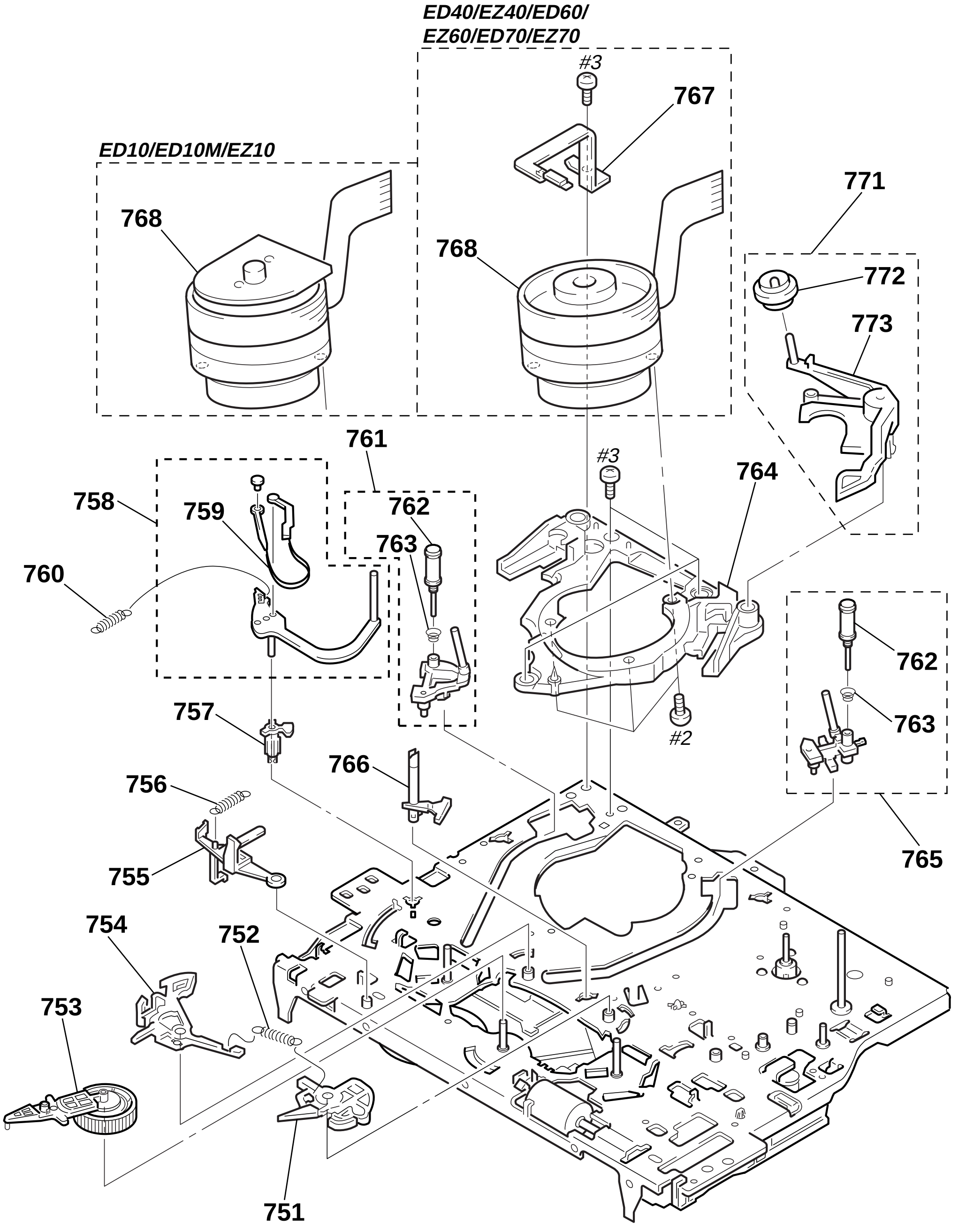
Ref. No.	Part No.	Description	Remark
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-B	FL COMPLETE ASSY	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	

Ref. No.	Part No.	Description	Remark
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
718	X-3947-582-1	ARM ASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8 ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3X8	
725	3-977-443-01	WASHER, STOPPER	

8-1-6. MECHANISM CHASSIS ASSEMBLY (2)


ED40/EZ40/ED60/
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757
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766
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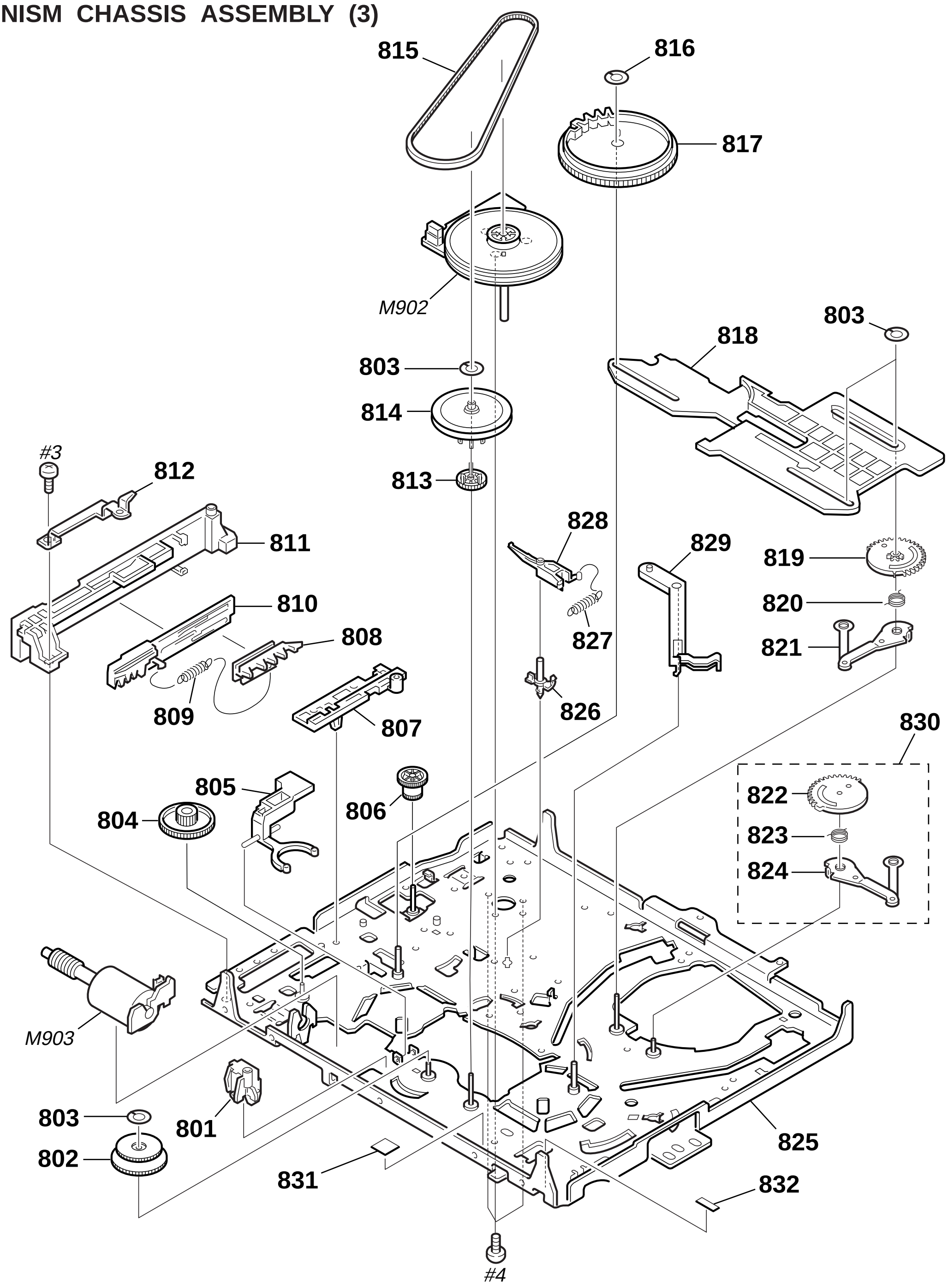
751

Ref. No.	Part No.	Description	Remark
751	X-3947-581-1	BRAKE ASSY, MAIN (T)	
752	3-977-462-01	SPRING, EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN (S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT (EXCEPT ED10/EZ10)	
768	1-759-453-11	DRUM ASSY DZH-89A-R (ED10/EZ10)	
768	8-839-037-04	DRUM ASSY DZH-74E/Z-RP (ED40/EZ40)	
768	8-839-045-02	DRUM ASSY DZH-95A/Z-RP (ED60/ED70/EZ60/EZ70)	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	

8-1-7. MECHANISM CHASSIS ASSEMBLY (3)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Ref. No.	Part No.	Description	Remark
801	3-977-437-01	RETAINER, CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING (T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING (T)	
822	3-977-451-01	GEAR, LOADING (S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING (S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING (S)	
831	3-989-917-01	SPACER (REC PROOF)	
832	3-052-730-01	SPACER (REC PROOF) (W4.5)	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service.
  Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA. . : μA. . uPA. . : μPA. .
  uPB. . : μPB. . uPC. . : μPC. .
  uPD. . : μPD. .
- CAPACITORS
  uF: μF
- COILS
  uH: μH
- Not all of the parts for POWER BLOCK HS-921SF/921SF1, SR-708/718 are listed.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6791-859-A	DM-85 BOARD, COMPLETE (ED40/ED60/EZ40/EZ60)			
*	A-6791-873-A	DM-85 BOARD, COMPLETE (ED70/EZ70) ********************* (Ref.No.2,000 Series)			
		< CONNECTOR >			
* CN441	1-750-737-11	CONNECTOR, FFC/FPC 5P (ED70/EZ70)			
CN442	1-784-449-11	CONNECTOR, FFC/FPC 7P			
		< JUMPER RESISTOR >			
JR401	1-216-296-00	METAL CHIP	0	5%	1/8W
		< RESISTOR >			
R442	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R443	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R444	1-216-295-00	METAL CHIP	0	5%	1/10W
R445	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R446	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R447	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		< SWITCH >			
S441	1-762-196-21	SWITCH, TACT (⏏ EJECT)			
S442	1-762-196-21	SWITCH, TACT (◀◀ REW)(ED70/EZ70)			
S443	1-762-196-21	SWITCH, TACT (▶▶ FF)(ED70/EZ70)			
S444	1-762-196-21	SWITCH, TACT (❚❚ PAUSE)			
S445	1-762-196-21	SWITCH, TACT (● REC)			
S447	1-762-196-21	SWITCH, TACT (◀◀ REW) (ED40/ED60/EZ40/EZ60)			
S448	1-762-196-21	SWITCH, TACT (▶▶ FF) (ED40/ED60/EZ40/EZ60)			
S449	1-762-196-21	SWITCH, TACT (■ STOP) (ED40/ED60/EZ40/EZ60)			
S450	1-762-196-21	SWITCH, TACT (▷ PLAY) (ED40/ED60/EZ40/EZ60)			
*	A-6796-662-A	DS-85 BOARD, COMPLETE (ED10/EZ10) ********************* (Ref.No.1,000 Series)			
		< CONNECTOR >			
* CN502	1-750-737-11	CONNECTOR, FFC/FPC 5P			
		< RESISTOR >			
R501	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R502	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R503	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
		< SWITCH >			
S501	1-762-196-21	SWITCH, TACT (▶▶ FF)			
S502	1-762-196-21	SWITCH, TACT (▷ PLAY)			
S503	1-762-196-21	SWITCH, TACT (■ STOP)			
S504	1-762-196-21	SWITCH, TACT (◀◀ REW)			
*	A-6791-880-A	GK-12 BOARD, COMPLETE (EZ70: AS) ********************* (Ref.No.1,000 Series)			
		< CAPACITOR >			
C003	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C006	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C007	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C008	1-164-699-11	CERAMIC CHIP	0.0033uF	5%	50V
C009	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C010	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C011	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C012	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C013	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C014	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C015	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C016	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C017	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C018	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C021	1-113-642-11	TANTAL. CHIP	47uF	10%	10V
C022	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C023	1-164-232-11	CERAMIC CHIP	0.01uF		50V
		< CONNECTOR >			
* CN001	1-691-183-11	CONNECTOR (BOARD TO BOARD) 13P			
		< IC >			
IC001	8-759-579-30	IC TDA9873H/V2,518			

Ref. No.	Part No.	Description			Remark
		< JUMPER RESISTOR >			
JS002	1-216-295-00	METAL CHIP	0	5%	1/10W
JS003	1-216-295-00	METAL CHIP	0	5%	1/10W
		< RESISTOR >			
R001	1-216-295-00	METAL CHIP	0	5%	1/10W
R002	1-216-295-00	METAL CHIP	0	5%	1/10W
R004	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R005	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R006	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R007	1-216-045-00	METAL CHIP	680	5%	1/10W
R008	1-216-041-00	METAL CHIP	470	5%	1/10W
R009	1-216-041-00	METAL CHIP	470	5%	1/10W
R010	1-208-803-11	RES, CHIP	7.5K	0.50%	1/10W
R011	1-216-295-00	METAL CHIP	0	5%	1/10W
R012	1-216-298-00	METAL CHIP	2.2	5%	1/10W
		< VARIABLE RESISTOR >			
RV001	1-241-783-11	RES, ADJ, CARBON 2.2K			
		< VIBRATOR >			
X001	1-781-353-11	VIBRATOR, CRYSTAL (4MHz)			

Ref. No.	Part No.	Description			Remark
*	A-6796-661-A	KK-18 BOARD, COMPLETE (ED10/EZ10)			
		**********************			
					(Ref.No.1,000 Series)
		< CONNECTOR >			
* CN511	1-568-942-11	PIN, CONNECTOR 4P			
		< JUMPER RESISTOR >			
JR511	1-216-296-00	METAL CHIP	0	5%	1/8W
		< SWITCH >			
S511	1-418-059-11	ENCODER, ROTARY (EASY TIMER)			

Ref. No.	Part No.	Description			Remark
*	A-6791-861-A	KK-19 BOARD, COMPLETE			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
		**********************			
					(Ref.No.2,000 Series)
		< CONNECTOR >			
* CN511	1-568-942-11	PIN, CONNECTOR 4P			
		< JUMPER RESISTOR >			
JR511	1-216-296-00	METAL CHIP	0	5%	1/8W
		< SWITCH >			
S511	1-418-059-11	ENCODER, ROTARY (EASY TIMER)			(ED40/ED60/ED70/EZ40)
S511	1-418-059-22	ENCODER, ROTARY (EASY TIMER)			(EZ60/EZ70)

Ref. No.	Part No.	Description			Remark
*	A-6791-857-A	MA-350 BOARD, COMPLETE (ED60: PS)			
*	A-6791-862-A	MA-350 BOARD, COMPLETE (ED60: ME, SG)			
*	A-6791-863-A	MA-350 BOARD, COMPLETE (EZ60)			
*	A-6791-866-A	MA-350 BOARD, COMPLETE (ED40: PS)			
*	A-6791-869-A	MA-350 BOARD, COMPLETE (ED40: ME, SG)			
*	A-6791-870-A	MA-350 BOARD, COMPLETE (EZ40)			
*	A-6791-872-A	MA-350 BOARD, COMPLETE (ED70)			
*	A-6791-875-A	MA-350 BOARD, COMPLETE (EZ70: AS)			
*	A-6791-878-A	MA-350 BOARD, COMPLETE (EZ70: NZ)			
*	A-6796-660-A	MA-350 BOARD, COMPLETE (ED10: MPS, PS)			
*	A-6796-663-A	MA-350 BOARD, COMPLETE (EZ10)			
*	A-6796-664-A	MA-350 BOARD, COMPLETE (ED10: ME, SG)			
		**********************			
					(Ref.No.1,000 Series)
*	3-960-273-01	SPACER, TOP END			
*	3-960-274-01	SPACER, LED			
*	3-966-865-01	BASE, INDICATION TUBE			
		< CAPACITOR >			
C100	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C101	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C102	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C103	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C104	1-128-057-11	ELECT	330uF	20%	6.3V
C110	1-124-589-11	ELECT	47uF	20%	16V
C111	1-124-589-11	ELECT	47uF	20%	16V
					(ED10/EZ10)
C112	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C113	1-164-344-11	CERAMIC CHIP	0.068uF	10%	25V
C114	1-124-589-11	ELECT	47uF	20%	16V
					(ED10/EZ10)
C114	1-126-767-11	ELECT	1000uF	20%	16V
					(ED40/ED60/ED70/EZ40/EZ60/EZ70)
C115	1-124-589-11	ELECT	47uF	20%	16V
C116	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C117	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C118	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C119	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C120	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C131	1-128-499-11	ELECT	220uF	20%	16V
C132	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C133	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C161	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C162	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C164	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C165	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C166	1-104-905-11	CAPACITOR	0.22F		5.5V
					(ED10: MPS, PS/ED40: PS/ED60: PS/ED70/ EZ10/EZ40/EZ60/EZ70)
C167	1-126-925-11	ELECT	470uF	20%	10V
C168	1-127-890-11	DOUBLE LAYER	0.47F		5.5V
					(ED10: ME, SG/ED40: ME, SG/ED60: ME, SG)
C171	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C172	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C173	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C174	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C175	1-163-234-11	CERAMIC CHIP	20PF	5%	50V
C176	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C177	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C178	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C179	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C191	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C192	1-124-234-00	ELECT	22uF	20%	16V
C193	1-126-157-11	ELECT	10uF	20%	16V

Ref. No.	Part No.	Description			Remark
C194	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C195	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C196	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (ED40/ED70/EZ70)
C197	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C201	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C203	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C204	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C205	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C206	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C207	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C208	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C209	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C210	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C210	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED10/EZ10)
C211	1-163-243-11	CERAMIC CHIP	47PF	5%	50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C211	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED10/EZ10)
C213	1-126-162-11	ELECT	3.3uF	20%	50V
C214	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C215	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C216	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C217	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C219	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C220	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C221	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C222	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C223	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C224	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C225	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C226	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C227	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C230	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C231	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C232	1-163-089-00	CERAMIC CHIP	6PF		50V
C233	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C234	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C235	1-163-231-11	CERAMIC CHIP	15PF	5%	50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C235	1-163-233-11	CERAMIC CHIP	18PF	5%	50V (ED10/EZ10)
C236	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C237	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C238	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C239	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C241	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C242	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C243	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C244	1-126-157-11	ELECT	10uF	20%	16V
C245	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C246	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C247	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C248	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C249	1-126-162-11	ELECT	3.3uF	20%	50V

Ref. No.	Part No.	Description			Remark
C250	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C251	1-126-157-11	ELECT	10uF	20%	16V
C253	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C254	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (ED40/ED60/ED70/EZ70)
C255	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C256	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C259	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C262	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C264	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C265	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C266	1-164-505-11	CERAMIC CHIP	2.2uF		16V (ED40/ED60/ED70/EZ70: AS)
C267	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C269	1-163-237-11	CERAMIC CHIP	27PF	5%	50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C269	1-163-241-11	CERAMIC CHIP	39PF	5%	50V (ED10/EZ10)
C270	1-163-237-11	CERAMIC CHIP	27PF	5%	50V (ED40/ED60/ED70/EZ40/EZ60/EZ70)
C270	1-163-241-11	CERAMIC CHIP	39PF	5%	50V (ED10/EZ10)
C274	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ70: AS)
C275	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40/ED60/ED70/EZ70: AS)
C301	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C302	1-124-234-00	ELECT	22uF	20%	16V
C303	1-126-163-11	ELECT	4.7uF	20%	50V
C304	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C305	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C306	1-126-163-11	ELECT	4.7uF	20%	50V
C307	1-126-157-11	ELECT	10uF	20%	16V
C308	1-126-160-11	ELECT	1uF	20%	50V (ED40)
C309	1-126-160-11	ELECT	1uF	20%	50V
C310	1-126-160-11	ELECT	1uF	20%	50V
C311	1-124-234-00	ELECT	22uF	20%	16V
C312	1-126-163-11	ELECT	4.7uF	20%	50V
C313	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C314	1-164-505-11	CERAMIC CHIP	2.2uF		16V (ED40)
C315	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C316	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C318	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C319	1-126-160-11	ELECT	1uF	20%	50V (ED60/ED70/EZ70)
C320	1-126-160-11	ELECT	1uF	20%	50V (ED40/ED60/ED70/EZ70)
C321	1-126-160-11	ELECT	1uF	20%	50V (ED40)
C322	1-164-232-11	CERAMIC CHIP	0.01uF		50V (ED40)
C323	1-124-589-11	ELECT	47uF	20%	16V
C330	1-104-697-11	FILM	0.047uF	5%	100V (ED40/ED70/EZ70)
C331	1-124-589-11	ELECT	47uF	20%	16V (ED40/ED70/EZ70)
C332	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (ED40/ED70/EZ70)
C333	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V (ED40/ED70/EZ70)

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Ref. No.	Part No.	Description				Remark
C334	1-164-232-11	CERAMIC CHIP	0.01uF		50V	(ED40/ED70/EZ70)
C335	1-104-696-11	FILM	0.015uF	5%	100V	(ED10/ED60/EZ10/EZ40/EZ60)
C335	1-137-612-11	FILM	0.0068uF	5%	100V	(ED40/ED70/EZ70)
C336	1-163-011-11	CERAMIC CHIP	0.0015uF	10%	50V	
C337	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C338	1-124-589-11	ELECT	47uF	20%	16V	
C339	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C341	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C342	1-126-157-11	ELECT	10uF	20%	16V	
C350	1-164-232-11	CERAMIC CHIP	0.01uF		50V	(ED60/ED70/EZ60/EZ70)
C351	1-164-232-11	CERAMIC CHIP	0.01uF		50V	(ED60/ED70/EZ60/EZ70)
C352	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C353	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(ED60/ED70/EZ60/EZ70)
C354	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C355	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	(ED60/ED70/EZ60/EZ70)
C356	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C357	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	(ED60/ED70/EZ60/EZ70)
C358	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C359	1-126-382-11	ELECT	100uF	20%	16V	(ED60/ED70/EZ60/EZ70)
C360	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	(ED60/ED70/EZ60/EZ70)
C361	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	(ED60/ED70/EZ60/EZ70)
C362	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	(ED60/ED70/EZ60/EZ70)
C363	1-104-664-11	ELECT	47uF	20%	16V	(ED60/ED70/EZ60/EZ70)
C369	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C370	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C371	1-126-960-11	ELECT	1uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C372	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C373	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C375	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C376	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(ED60/ED70/EZ60/EZ70)
C377	1-104-664-11	ELECT	47uF	20%	16V	(ED60/ED70/EZ60/EZ70)
C378	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C379	1-126-961-11	ELECT	2.2uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C380	1-126-964-11	ELECT	10uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C381	1-104-664-11	ELECT	47uF	20%	16V	(ED60/ED70/EZ60/EZ70)
C382	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(ED60/ED70/EZ60/EZ70)
C383	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C384	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(ED60/ED70/EZ60/EZ70)
C385	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C386	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	(ED60/ED70/EZ60/EZ70)
C387	1-126-960-11	ELECT	1uF	20%	50V	(ED60/ED70/EZ60/EZ70)
C400	1-117-720-11	CERAMIC CHIP	4.7uF		10V	
C401	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C402	1-163-229-11	CERAMIC CHIP	12PF	5%	50V	
C403	1-126-163-11	ELECT	4.7uF	20%	50V	
C404	1-126-157-11	ELECT	10uF	20%	16V	
C405	1-163-251-11	CERAMIC CHIP	100PF	5%	50V	
C406	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C407	1-126-163-11	ELECT	4.7uF	20%	50V	
C408	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	
C409	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	
C411	1-163-229-11	CERAMIC CHIP	12PF	5%	50V	
C412	1-163-224-11	CERAMIC CHIP	7PF	0.25PF	50V	
C414	1-109-982-11	CERAMIC CHIP	1uF	10%	10V	
C415	1-163-245-11	CERAMIC CHIP	56PF	5%	50V	
C421	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C422	1-124-589-11	ELECT	47uF	20%	16V	
C423	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C424	1-126-157-11	ELECT	10uF	20%	16V	
C450	1-164-232-11	CERAMIC CHIP	0.01uF		50V	(ED10/EZ10)
C451	1-124-589-11	ELECT	47uF	20%	16V	
C600	1-126-163-11	ELECT	4.7uF	20%	50V	
C601	1-124-261-00	ELECT	10uF	20%	50V	
C602	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C603	1-126-935-11	ELECT	470uF	20%	16V	
C604	1-124-589-11	ELECT	47uF	20%	16V	
C605	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C607	1-124-589-11	ELECT	47uF	20%	16V	
C608	1-126-933-11	ELECT	100uF	20%	16V	
C609	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C611	1-124-589-11	ELECT	47uF	20%	16V	
C701	1-126-933-11	ELECT	100uF	20%	16V	
C702	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C703	1-104-664-11	ELECT	47uF	20%	16V	
C706	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C707	1-126-163-11	ELECT	4.7uF	20%	50V	
C708	1-126-933-11	ELECT	100uF	20%	16V	
C709	1-126-933-11	ELECT	100uF	20%	16V	
C710	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C711	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C712	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C713	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C714	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C715	1-126-933-11	ELECT	100uF	20%	16V	
C716	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C717	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C718	1-126-933-11	ELECT	100uF	20%	16V	(ED70/EZ70)

	Ref. No.	Part No.	Description	Remark
	C719	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V (ED70/EZ70)
	C720	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V (ED70/EZ70)
	C721	1-164-232-11	CERAMIC CHIP 0.01uF	50V (ED70/EZ70)
	C722	1-124-589-11	ELECT 47uF 20%	16V
	C902	1-126-925-11	ELECT 470uF 20%	10V
	C904	1-104-664-11	ELECT 47uF 20%	16V
	C908	1-126-960-11	ELECT 1uF 20%	50V
	C909	1-126-960-11	ELECT 1uF 20%	50V (ED60/ED70/EZ60/EZ70)
			< CONNECTOR >	
*	CN101	1-568-954-11	PIN, CONNECTOR 5P (ED40/ED60/ED70/EZ40/EZ60/EZ70)	
	CN102	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P	
*	CN103	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P	
	CN104	1-784-486-11	CONNECTOR, FFC/FPC 7P (ED10/EZ10)	
	CN191	1-506-468-11	PIN, CONNECTOR 3P	
	CN201	1-784-492-11	CONNECTOR, FFC/FPC 13P (ED60/ED70/EZ60/EZ70)	
	CN202	1-784-487-11	CONNECTOR, FFC/FPC 8P (ED10/ED40/EZ10/EZ40)	
*	CN203	1-560-892-00	PIN, CONNECTOR 4P	
*	CN204	1-568-954-11	PIN, CONNECTOR 5P (ED40/ED60/ED70/EZ70)	
	CN330	1-506-468-11	PIN, CONNECTOR 3P	
	CN331	1-506-469-11	PIN, CONNECTOR 4P	
	CN450	1-506-469-11	PIN, CONNECTOR 4P	
	CN451	1-784-486-11	CONNECTOR, FFC/FPC 7P (ED40/ED70/EZ70)	
	CN452	1-784-486-11	CONNECTOR, FFC/FPC 7P (ED40/ED60/ED70/EZ40/EZ60/EZ70)	
	CN453	1-784-484-11	CONNECTOR, FFC/FPC 5P (ED10/EZ10)	
	CN454	1-784-484-11	CONNECTOR, FFC/FPC 5P (ED60/EZ40/EZ60)	
*	CN600	1-568-936-11	PIN, CONNECTOR 9P (ED40/ED60/ED70/EZ40/EZ60/EZ70)	
	CN600	1-784-946-11	CONNECTOR, BOARD TO BOARD 9P (ED10/EZ10)	
	CN701	1-691-170-11	PIN, CONNECTOR 13P (ED70/EZ70)	
*	CN702	1-568-954-11	PIN, CONNECTOR 5P (EZ70: NZ)	
*	CN901	1-568-937-11	PIN, CONNECTOR 10P (ED60/ED70/EZ70: AS)	
	CN902	1-568-953-21	PIN, CONNECTOR 4P (ED40)	
	CN903	1-506-469-11	PIN, CONNECTOR 4P (EZ60/EZ70: NZ)	
			< JACK >	
	CNJ901	1-779-011-11	JACK, PIN 6P (LINE-1 IN/LINE-1 OUT) (ED60/ED70/EZ60/EZ70)	
	CNJ902	1-779-012-21	JACK, PIN 5P (LINE-1 IN/LINE OUT) (ED40)	
	CNJ903	1-779-010-11	JACK, PIN 4P (LINE IN/LINE OUT) (ED10/EZ10/EZ40)	
			< DIODE >	
	D102	8-719-048-26	DIODE GL528V1	
	D111	8-719-200-82	DIODE MPG06D-6052PKG3	
	D164	8-719-200-82	DIODE MPG06D-6052PKG3	
	D401	8-719-911-19	DIODE 1SS119-25TD	
	D402	8-719-911-19	DIODE 1SS119-25TD	
	D403	8-719-911-19	DIODE 1SS119-25TD	
	D450	8-719-056-07	DIODE SLR-342MCT31 (ON/STANDBY) (ED10/EZ10)	
	D603	8-719-911-19	DIODE 1SS119-25TD	
	D606	8-719-200-82	DIODE MPG06D-6052PKG3	
	D703	8-719-150-92	DIODE RD33ES-T1B	

Ref. No.	Part No.	Description	Remark
		< ENCAPSULATED COMPONENT >	
FL901	1-236-163-11	ENCAPSULATED COMPONENT (EZ10/EZ40/EZ60/EZ70)	
FL902	1-236-163-11	ENCAPSULATED COMPONENT (EZ60/EZ70)	
		< IC >	
IC130	8-759-481-46	IC LB1943	
IC161	8-759-579-70	IC HD6433977R-GA (ED10/ED40/ED60/ED70)	
IC161	8-759-579-71	IC HD6433977R-AZ (EZ10/EZ40/EZ60)	
IC161	8-759-579-72	IC HD6433977R-AS (EZ70: AS)	
IC161	8-759-579-73	IC HD6433977R-NZ (EZ70: NZ)	
IC162	8-759-580-62	IC MM1256AFBE	
IC163	8-759-575-70	IC M24C02-WMN6T	
IC201	8-759-562-59	IC HA118211BF	
IC202	8-759-295-66	IC BA7653AF-E2 (ED40/ED60/ED70/EZ70: AS)	
IC301	8-759-526-64	IC NJM2521M (TE2) (ED40)	
IC350	8-759-486-92	IC LA7256 (ED60/ED70/EZ60/EZ70)	
IC360	8-759-486-64	IC TDA9615H/N1,557 (ED60/ED70/EZ60/EZ70)	
IC420	8-759-566-61	IC uPD16312GB-3BS	
IC450	8-742-042-00	IC SBX1986-51 (ED10/EZ10)	
IC600	8-759-438-18	IC PQ12RD08	
IC601	8-759-701-56	IC NJM78M05FA	
IC602	8-759-471-81	IC PQ05RD11	
		< JUMPER RESISTOR >	
JR001	1-216-295-00	METAL CHIP 0 5%	1/10W
JR002	1-216-295-00	METAL CHIP 0 5%	1/10W (ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR003	1-216-295-00	METAL CHIP 0 5%	1/10W
JR004	1-216-295-00	METAL CHIP 0 5%	1/10W
JR005	1-216-295-00	METAL CHIP 0 5%	1/10W
JR006	1-216-295-00	METAL CHIP 0 5%	1/10W
JR007	1-216-295-00	METAL CHIP 0 5%	1/10W
JR008	1-216-295-00	METAL CHIP 0 5%	1/10W (ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR009	1-216-295-00	METAL CHIP 0 5%	1/10W
JR010	1-216-295-00	METAL CHIP 0 5%	1/10W
JR011	1-216-295-00	METAL CHIP 0 5%	1/10W
JR012	1-216-295-00	METAL CHIP 0 5%	1/10W
JR013	1-216-295-00	METAL CHIP 0 5%	1/10W
JR014	1-216-295-00	METAL CHIP 0 5%	1/10W
JR015	1-216-295-00	METAL CHIP 0 5%	1/10W
JR016	1-216-295-00	METAL CHIP 0 5%	1/10W
JR017	1-216-295-00	METAL CHIP 0 5%	1/10W (ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR018	1-216-295-00	METAL CHIP 0 5%	1/10W
JR019	1-216-295-00	METAL CHIP 0 5%	1/10W
JR020	1-216-295-00	METAL CHIP 0 5%	1/10W
JR021	1-216-295-00	METAL CHIP 0 5%	1/10W
JR022	1-216-295-00	METAL CHIP 0 5%	1/10W
JR023	1-216-295-00	METAL CHIP 0 5%	1/10W
JR024	1-216-295-00	METAL CHIP 0 5%	1/10W
JR025	1-216-295-00	METAL CHIP 0 5%	1/10W
JR201	1-216-296-00	METAL CHIP 0 5%	1/8W
JR202	1-216-296-00	METAL CHIP 0 5%	1/8W (ED60/ED70/EZ60/EZ70)
JR203	1-216-296-00	METAL CHIP 0 5%	1/8W (ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR204	1-216-296-00	METAL CHIP 0 5%	1/8W (ED40/ED60/ED70/EZ40/EZ60/EZ70)

Ref. No.	Part No.	Description	Remark
JR205	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED60/ED70/EZ60/EZ70)
JR206	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED60/ED70/EZ60/EZ70)
JR207	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED60/ED70/EZ60/EZ70)
JR209	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR210	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR211	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR212	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR213	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR214	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR215	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR216	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR217	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR218	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR219	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR220	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR221	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR222	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR223	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR224	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR225	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR226	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR227	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR228	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR229	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED60/ED70/EZ60/EZ70)
JR230	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR231	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR232	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR233	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR234	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR235	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR236	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR237	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR238	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR239	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR240	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR241	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
JR242	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR243	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR245	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR247	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR248	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR249	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR251	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR252	1-216-296-00	METAL CHIP 0 5% 1/8W	
JS203	1-216-296-00	METAL CHIP 0 5% 1/8W	(EZ70: NZ)
JS301	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED10/ED40/EZ10/EZ40)
JS305	1-216-295-00	METAL CHIP 0 5% 1/10W	

Ref. No.	Part No.	Description	Remark
JS331	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED10/ED60/EZ10/EZ40/EZ60)
JS361	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/ED70/EZ60/EZ70)
JS401	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS451	1-216-295-00	METAL CHIP 0 5% 1/10W	
JS701	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/EZ60)
JS702	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/EZ60)
JS703	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED70/EZ70)
JS707	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED10/ED40/ED60/EZ10/EZ40/EZ60)
JS708	1-216-295-00	METAL CHIP 0 5% 1/10W	(EXCEPT EZ70: NZ)
JS902	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED40)
JS904	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED10/ED40/ED60/ED70)
JS905	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED60/ED70)
JS908	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED10/ED40/EZ10/EZ40)
		< COIL >	
L110	1-414-185-51	INDUCTOR 22uH (ED10/EZ10)	
L205	1-410-510-11	INDUCTOR 12uH	
L206	1-410-520-11	INDUCTOR 82uH	
L207	1-410-520-11	INDUCTOR 82uH	
L212	1-414-856-51	INDUCTOR 10uH	
L301	1-412-092-11	INDUCTOR 22mH	
L330	1-410-120-11	INDUCTOR 1.2mH (ED40/ED70/EZ70)	
L331	1-410-120-11	INDUCTOR 1.2mH	
L351	1-414-857-51	INDUCTOR 100uH (ED60/ED70/EZ60/EZ70)	
L400	1-414-184-51	INDUCTOR 15uH	
L401	1-414-185-51	INDUCTOR 22uH	
L402	1-414-185-51	INDUCTOR 22uH	
L403	1-414-185-51	INDUCTOR 22uH	
L600	1-414-187-51	INDUCTOR 47uH	
L601	1-414-856-51	INDUCTOR 10uH	
L602	1-414-856-51	INDUCTOR 10uH	
L701	1-414-179-51	INDUCTOR 2.2uH	
L702	1-414-856-51	INDUCTOR 10uH	
L703	1-414-856-51	INDUCTOR 10uH	
L704	1-414-856-51	INDUCTOR 10uH	
L705	1-414-856-51	INDUCTOR 10uH (ED70/EZ70)	
		< FLUORECENT INDICATOR >	
ND420	1-517-734-11	TUBE, FLUORESCENT INDICATOR	
		< PHOTO INTERRUPTER >	
PH100	8-749-013-23	PHOTO INTERRUPTER GP3S120	
PH101	8-749-013-23	PHOTO INTERRUPTER GP3S120	
		< IC LINK >	
⚠PS111	1-533-593-11	LINK, IC (2A)	
⚠PS330	1-533-586-31	LINK, IC (315mA)	
⚠PS600	1-533-593-11	LINK, IC (2A)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
⚠PS601	1-533-586-31	LINK, IC (315mA)			
		< TRANSISTOR >			
Q100	8-729-043-84	TRANSISTOR	PT380F3		
Q101	8-729-043-84	TRANSISTOR	PT380F3		
Q102	8-729-281-53	TRANSISTOR	2SC1815GR-TPE2		
Q161	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		
Q191	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		(ED40/ED70/EZ70)
Q201	8-729-421-19	TRANSISTOR	UN2213-TX		
Q202	8-729-421-19	TRANSISTOR	UN2213-TX		
Q203	8-729-421-19	TRANSISTOR	UN2213-TX		
Q206	8-729-421-19	TRANSISTOR	UN2213-TX		
Q330	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q		(ED40/ED70/EZ70)
Q331	8-729-900-51	TRANSISTOR	UN2115-QRS (TX)		(ED40/ED70/EZ70)
Q332	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q		
Q333	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		
Q334	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		
Q335	8-729-900-51	TRANSISTOR	UN2115-QRS (TX)		
Q337	8-729-424-18	TRANSISTOR	UN2113-TX		
Q338	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		
Q400	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX		
Q401	8-729-421-19	TRANSISTOR	UN2213-TX		
Q402	8-729-421-22	TRANSISTOR	UN2211-TX		
Q403	8-729-421-22	TRANSISTOR	UN2211-TX		
Q410	8-729-422-27	TRANSISTOR	2SD601A-QRS-TX		
Q701	8-729-106-68	TRANSISTOR	2SD1664-T100-R		
Q702	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX		(ED70/EZ70)
Q901	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX		
		< RESISTOR >			
R100	1-249-437-11	CARBON	47K	5%	1/4W
R101	1-216-041-00	METAL CHIP	470	5%	1/10W
R102	1-249-437-11	CARBON	47K	5%	1/4W
R103	1-216-085-00	METAL CHIP	33K	5%	1/10W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R106	1-249-417-11	CARBON	1K	5%	1/4W
R107	1-249-400-11	CARBON	39	5%	1/4W
R108	1-249-400-11	CARBON	39	5%	1/4W
R110	1-249-429-11	CARBON	10K	5%	1/4W
R111	1-216-073-00	METAL CHIP	10K	5%	1/10W
R112	1-216-073-00	METAL CHIP	10K	5%	1/10W
R113	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R114	1-216-049-00	METAL CHIP	1K	5%	1/10W
R115	1-216-049-00	METAL CHIP	1K	5%	1/10W
R116	1-216-103-00	METAL CHIP	180K	5%	1/10W
R117	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R118	1-216-049-00	METAL CHIP	1K	5%	1/10W
R119	1-216-103-00	METAL CHIP	180K	5%	1/10W
R120	1-216-049-00	METAL CHIP	1K	5%	1/10W
R121	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R122	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R130	1-216-085-00	METAL CHIP	33K	5%	1/10W
R131	1-216-085-00	METAL CHIP	33K	5%	1/10W
R132	1-216-089-00	METAL CHIP	47K	5%	1/10W
R160	1-216-041-00	METAL CHIP	470	5%	1/10W
R161	1-216-073-00	METAL CHIP	10K	5%	1/10W
R162	1-216-049-00	METAL CHIP	1K	5%	1/10W
R163	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R164	1-216-073-00	METAL CHIP	10K	5%	1/10W
R165	1-216-049-00	METAL CHIP	1K	5%	1/10W
R166	1-216-059-00	METAL CHIP	2.7K	5%	1/10W (ED10/EZ40)
R166	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (ED40/EZ60)
R166	1-216-069-00	METAL CHIP	6.8K	5%	1/10W (ED60/EZ70: AS)
R166	1-216-073-00	METAL CHIP	10K	5%	1/10W (ED70/EZ70: NZ)
R166	1-216-051-00	METAL CHIP	1.2K	5%	1/10W (EZ10)
R167	1-216-073-00	METAL CHIP	10K	5%	1/10W
R168	1-247-863-91	CARBON	22K	5%	1/4W
R169	1-216-049-00	METAL CHIP	1K	5%	1/10W
R170	1-216-121-91	RES, CHIP	1M	5%	1/10W
R171	1-216-049-00	METAL CHIP	1K	5%	1/10W
R172	1-216-073-00	METAL CHIP	10K	5%	1/10W
R173	1-216-073-00	METAL CHIP	10K	5%	1/10W
R174	1-216-073-00	METAL CHIP	10K	5%	1/10W
R175	1-216-113-00	METAL CHIP	470K	5%	1/10W
R176	1-216-089-00	METAL CHIP	47K	5%	1/10W
R177	1-216-105-91	RES, CHIP	220K	5%	1/10W
R178	1-216-089-00	METAL CHIP	47K	5%	1/10W
R179	1-216-089-00	METAL CHIP	47K	5%	1/10W
R180	1-216-089-00	METAL CHIP	47K	5%	1/10W
R181	1-216-041-00	METAL CHIP	470	5%	1/10W
R182	1-216-049-00	METAL CHIP	1K	5%	1/10W
R183	1-216-041-00	METAL CHIP	470	5%	1/10W
R184	1-216-073-00	METAL CHIP	10K	5%	1/10W
R185	1-216-073-00	METAL CHIP	10K	5%	1/10W
R186	1-249-417-11	CARBON	1K	5%	1/4W
R187	1-216-049-00	METAL CHIP	1K	5%	1/10W
R188	1-216-049-00	METAL CHIP	1K	5%	1/10W
R189	1-216-073-00	METAL CHIP	10K	5%	1/10W
R190	1-216-073-00	METAL CHIP	10K	5%	1/10W
R191	1-216-103-00	METAL CHIP	180K	5%	1/10W
R192	1-216-049-00	METAL CHIP	1K	5%	1/10W
R193	1-216-121-91	RES, CHIP	1M	5%	1/10W
R194	1-249-437-11	CARBON	47K	5%	1/4W (ED40/ED70/EZ70)
R195	1-216-037-00	METAL CHIP	330	5%	1/10W
R196	1-216-037-00	METAL CHIP	330	5%	1/10W
R198	1-216-089-00	METAL CHIP	47K	5%	1/10W
R199	1-216-041-00	METAL CHIP	470	5%	1/10W
R201	1-216-041-00	METAL CHIP	470	5%	1/10W
R202	1-216-083-00	METAL CHIP	27K	5%	1/10W
R203	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R205	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R206	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R207	1-216-051-00	METAL CHIP	1.2K	5%	1/10W (ED10/EZ10)
R207	1-216-065-00	METAL CHIP	4.7K	5%	1/10W (ED40/ED60/ED70/EZ40/EZ60/EZ70)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
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Ref. No.	Part No.	Description				Remark
R208	1-216-063-91	RES, CHIP	3.9K	5%	1/10W	(ED10/EZ10)
R208	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(ED40/ED60/ED70/EZ40/EZ60/EZ70)
R209	1-216-127-11	METAL CHIP	1.8M	5%	1/10W	
R210	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R212	1-216-025-91	RES, CHIP	100	5%	1/10W	(ED40/ED60/ED70/EZ70)
R214	1-247-807-31	CARBON	100	5%	1/4W	
R215	1-247-807-31	CARBON	100	5%	1/4W	
R216	1-216-095-00	METAL CHIP	82K	5%	1/10W	(EZ10/EZ40/EZ60/EZ70)
R217	1-216-025-91	RES, CHIP	100	5%	1/10W	
R218	1-216-025-91	RES, CHIP	100	5%	1/10W	
R220	1-216-295-00	METAL CHIP	0	5%	1/10W	(ED40/ED60/ED70/EZ70: AS)
R221	1-216-295-00	METAL CHIP	0	5%	1/10W	(ED40/ED60/ED70/EZ70: AS)
R224	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R301	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R302	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R303	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R304	1-216-025-91	RES, CHIP	100	5%	1/10W	
R305	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R306	1-216-083-00	METAL CHIP	27K	5%	1/10W	
R307	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R308	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R309	1-216-077-00	METAL CHIP	15K	5%	1/10W	
R310	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R313	1-216-089-00	METAL CHIP	47K	5%	1/10W	(ED40)
R314	1-216-295-00	METAL CHIP	0	5%	1/10W	
R315	1-216-041-00	METAL CHIP	470	5%	1/10W	
R316	1-216-077-00	METAL CHIP	15K	5%	1/10W	(ED40)
R317	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R318	1-249-421-11	CARBON	2.2K	5%	1/4W	
R319	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R323	1-216-125-00	METAL CHIP	1.5M	5%	1/10W	
R330	1-249-394-11	CARBON	12	5%	1/4W	F (ED40/ED70/EZ70)
R331	1-216-295-00	METAL CHIP	0	5%	1/10W	(ED40/ED70/EZ70)
R332	1-216-083-00	METAL CHIP	27K	5%	1/10W	(ED40/ED70/EZ70)
R334	1-216-295-00	METAL CHIP	0	5%	1/10W	
R335	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R337	1-216-295-00	METAL CHIP	0	5%	1/10W	
R338	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R339	1-216-081-00	METAL CHIP	22K	5%	1/10W	(ED10/ED60/EZ10/EZ40/EZ60)
R339	1-216-083-00	METAL CHIP	27K	5%	1/10W	(ED40/ED70/EZ70)
R340	1-249-389-11	CARBON	4.7	5%	1/4W	F (ED10/ED60/EZ10/EZ40/EZ60)
R340	1-249-395-11	CARBON	15	5%	1/4W	F (ED40/ED70/EZ70)
R341	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R342	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R344	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R345	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R346	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R347	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R350	1-216-081-00	METAL CHIP	22K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R351	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R352	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R353	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R354	1-216-033-00	METAL CHIP	220	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R355	1-216-295-00	METAL CHIP	0	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R360	1-216-049-00	METAL CHIP	1K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R361	1-216-049-00	METAL CHIP	1K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R368	1-216-133-00	METAL CHIP	3.3M	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R370	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R371	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(ED60/ED70/EZ60/EZ70)
R372	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R378	1-249-434-11	CARBON	27K	5%	1/4W	(ED60/ED70/EZ60/EZ70)
R379	1-216-073-00	METAL CHIP	10K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R380	1-249-413-11	CARBON	470	5%	1/4W	(ED60/ED70/EZ60/EZ70)
R381	1-249-413-11	CARBON	470	5%	1/4W	(ED60/ED70/EZ60/EZ70)
R382	1-249-413-11	CARBON	470	5%	1/4W	(ED60/ED70/EZ60/EZ70)
R383	1-249-413-11	CARBON	470	5%	1/4W	(ED60/ED70/EZ60/EZ70)
R384	1-216-091-00	METAL CHIP	56K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R385	1-216-091-00	METAL CHIP	56K	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R386	1-216-041-00	METAL CHIP	470	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R387	1-216-041-00	METAL CHIP	470	5%	1/10W	(ED60/ED70/EZ60/EZ70)
R400	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R401	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R402	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R403	1-216-041-00	METAL CHIP	470	5%	1/10W	
R404	1-249-429-11	CARBON	10K	5%	1/4W	
R405	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R406	1-216-041-00	METAL CHIP	470	5%	1/10W	
R407	1-216-121-91	RES, CHIP	1M	5%	1/10W	
R408	1-216-025-91	RES, CHIP	100	5%	1/10W	
R409	1-216-295-00	METAL CHIP	0	5%	1/10W	
R410	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R411	1-216-051-00	METAL CHIP	1.2K	5%	1/10W	
R412	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R413	1-249-417-11	CARBON	1K	5%	1/4W	
R414	1-249-417-11	CARBON	1K	5%	1/4W	
R421	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R422	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R423	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R424	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R425	1-216-085-00	METAL CHIP	33K	5%	1/10W	

Ref. No.	Part No.	Description			Remark	
R426	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R428	1-216-041-00	METAL CHIP	470	5%	1/10W	
R429	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R432	1-249-429-11	CARBON	10K	5%	1/4W	
R450	1-216-029-00	METAL CHIP	150	5%	1/10W (ED10/EZ10)	
R451	1-216-021-00	METAL CHIP	68	5%	1/10W	
R452	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	
R453	1-216-053-00	METAL CHIP	1.5K	5%	1/10W (ED10/EZ10)	
R454	1-249-421-11	CARBON	2.2K	5%	1/4W (ED10/EZ10)	
R455	1-216-021-00	METAL CHIP	68	5%	1/10W	
R456	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R457	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R458	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	
R459	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R460	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R461	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R462	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R463	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R464	1-216-081-00	METAL CHIP	22K	5%	1/10W (ED10/ED40/ED60/ED70/EZ70)	
R465	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R466	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R468	1-249-431-11	CARBON	15K	5%	1/4W	
R469	1-249-437-11	CARBON	47K	5%	1/4W	
R470	1-249-437-11	CARBON	47K	5%	1/4W	
R602	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R608	1-216-471-11	METAL OXIDE	27	5%	3W	F
R609	1-215-857-11	METAL OXIDE	10	5%	1W	F
R616	1-249-419-11	CARBON	1.5K	5%	1/4W	
⚠R702	1-212-893-00	FUSIBLE	330	5%	1/4W	F
R703	1-216-041-00	METAL CHIP	470	5%	1/10W	
R704	1-216-041-00	METAL CHIP	470	5%	1/10W	
R705	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R706	1-216-113-00	METAL CHIP	470K	5%	1/10W	
R707	1-216-049-00	METAL CHIP	1K	5%	1/10W (ED70/EZ70)	
R709	1-247-807-31	CARBON	100	5%	1/4W	
R901	1-216-021-00	METAL CHIP	68	5%	1/10W	
R902	1-249-407-11	CARBON	150	5%	1/4W	
R904	1-249-408-11	CARBON	180	5%	1/4W	
R905	1-216-025-91	RES, CHIP	100	5%	1/10W	
R906	1-216-021-00	METAL CHIP	68	5%	1/10W	
R907	1-216-041-00	METAL CHIP	470	5%	1/10W	
R908	1-216-041-00	METAL CHIP	470	5%	1/10W (ED60/ED70/EZ60/EZ70)	
R913	1-216-295-00	METAL CHIP	0	5%	1/10W	
R914	1-216-295-00	METAL CHIP	0	5%	1/10W (ED60/ED70/EZ60/EZ70)	
		< SWITCH >				
S100	1-771-155-11	SWITCH, ROTARY (CAM ENCODER)				
S101	1-762-108-11	SWITCH, PUSH (1 KEY) (REC PROOF)				
S450	1-771-574-21	SWITCH, TACTILE (I/⏻) (ED10/EZ10)				
S451	1-771-574-21	SWITCH, TACTILE (⏏EJECT) (ED10/EZ10)				
S452	1-771-574-21	SWITCH, TACTILE (● REC) (ED10/EZ10)				

Ref. No.	Part No.	Description			Remark
S453	1-771-574-21	SWITCH, TACTILE (PROGRAM/TRACKING +)			(ED10/EZ10)
S454	1-771-574-21	SWITCH, TACTILE (PROGRAM/TRACKING +)			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
S455	1-771-574-21	SWITCH, TACTILE (COLOR SYSTEM)			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
S456	1-771-574-21	SWITCH, TACTILE (COLOR SYSTEM)			(ED10/EZ10)
S457	1-771-574-21	SWITCH, TACTILE (❚❚ PAUSE) (ED10/EZ10)			
S458	1-771-574-21	SWITCH, TACTILE (PROGRAM/TRACKING -)			(ED10/EZ10)
S459	1-771-574-21	SWITCH, TACTILE (PROGRAM/TRACKING -)			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
S460	1-771-574-21	SWITCH, TACTILE (ONE TOUCH TUNING/ RF CHANNEL)(ED10/EZ10)			
S461	1-771-574-21	SWITCH, TACTILE (ONE TOUCH TUNING/RF CHANNEL)			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
S462	1-771-574-21	SWITCH, TACTILE (SP/LP (SP/EP))			(ED40/ED60/ED70/EZ40/EZ60/EZ70)
S463	1-571-308-11	SWITCH, SLIDE (NTSC PB)			(ED10/ED40/ED60/ED70/EZ70)
S464	1-571-588-11	SWITCH, SLIDE (NTSC PB) (EZ10/EZ40/EZ60)			
S466	1-771-574-21	SWITCH, TACTILE (INPUT SELECT)			(ED4 0/ED60/ED70/EZ40/EZ60/EZ70)
		< TRANSFORMER >			
T330	1-423-415-11	TRANSFORMER, BIAS OSCILLATION			(ED40/ED70/EZ70)
T331	1-423-413-11	TRANSFORMER, BIAS OSCILLATION			(ED40/ED70/EZ70)
T331	1-423-414-11	TRANSFORMER, BIAS OSCILLATION			(ED10/ED60/EZ10/EZ40/EZ60)
		< TUNER >			
TU701	1-693-415-11	TUNER, MOD/IF SOLID TYPE (AERIAL)			(ED10/ED40/ED60/ED70)
TU701	1-693-416-11	TUNER, MOD/IF SOLID TYPE (AERIAL)			(EZ10/EZ40/EZ60/EZ70)
		< VIBRATOR >			
X161	1-767-855-11	VIBRATOR, CRYSTAL (10MHz)			
X162	1-579-463-11	VIBRATOR, CRYSTAL (32.768kHz)			
X201	1-760-708-11	VIBRATOR, CRYSTAL (4.433619MHz)			
* X202	1-760-709-11	VIBRATOR, CRYSTAL (3.579545MHz)			(ED10/ED40/ED60/ED70/EZ70)
X401	1-767-856-11	VIBRATOR, CRYSTAL (17.734475MHz)			

Ref. No.	Part No.	Description			Remark
*	A-6791-860-A	MF-317 BOARD, COMPLETE (ED60)			
*	A-6791-865-A	MF-317 BOARD, COMPLETE (EZ40/EZ60)			
*	A-6791-868-A	MF-317 BOARD, COMPLETE (ED40)			
*	A-6791-874-A	MF-317 BOARD, COMPLETE (ED70)			
*	A-6791-877-A	MF-317 BOARD, COMPLETE (EZ70)			
		**********************			
					(Ref.No.2,000 Series)
		< CAPACITOR >			
C461	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C481	1-163-009-11	CERAMIC CHIP (ED40/ED60/ED70/EZ70)	0.001uF	10%	50V

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN461	1-784-449-11	CONNECTOR, FFC/FPC 7P (ED40/ED70/EZ70)	
* CN481	1-568-943-11	PIN, CONNECTOR 5P (ED40/ED60/ED70/EZ70)	
CN482	1-784-447-11	CONNECTOR, FFC/FPC 5P (ED60/EZ40/EZ60)	
		< JACK >	
CNJ481	1-766-861-11	JACK, PIN (3P) (LINE-2 IN) (ED60/ED70/EZ70)	
CNJ481	1-784-570-11	JACK, PIN 3P (LINE-2 IN) (ED40)	
		< DIODE >	
D461	8-719-056-07	DIODE SLR-342MCT31 (ON/STANDBY)	
D462	8-719-045-62	DIODE SLR-342VCT31 (SYNCHRO REC)	(ED40/ED70/EZ70)
D480	8-719-017-09	DIODE 02DZ6.2-TPH3	(ED40/ED60/ED70/EZ70)
D481	8-719-071-15	DIODE HZM6.8ZWA1TL	(ED40/ED60/ED70/EZ70)
D490	8-719-071-15	DIODE HZM6.8ZWA1TL	(ED40/ED60/ED70/EZ70)
D491	8-719-071-15	DIODE HZM6.8ZWA1TL	(ED40/ED60/ED70/EZ70)
		< ENCAPSULATED COMPONENT >	
FL491	1-236-163-11	ENCAPSULATED COMPONENT (EZ70)	
FL492	1-236-163-11	ENCAPSULATED COMPONENT (EZ70)	
		< IC >	
IC461	8-749-011-05	IC GP1U28X	
		< JUMPER RESISTOR >	
JR400	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR402	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR403	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR404	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR405	1-216-296-00	METAL CHIP 0 5% 1/8W	
JS490	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70/EZ70)
JS491	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED40)
JS492	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED40/ED60/ED70)
JS493	1-216-296-00	METAL CHIP 0 5% 1/8W	(ED40/ED60/ED70)
JS494	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/ED70/EZ70)
		< RESISTOR >	
R461	1-216-029-00	METAL CHIP 150 5% 1/10W	
R462	1-216-037-00	METAL CHIP 330 5% 1/10W	(ED40/ED70/EZ70)
R480	1-216-021-00	METAL CHIP 68 5% 1/10W	(ED40/ED60/ED70/EZ70)
R490	1-216-041-00	METAL CHIP 470 5% 1/10W	(ED40)
R490	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/ED70/EZ70)
R491	1-216-041-00	METAL CHIP 470 5% 1/10W	(ED40)
R491	1-216-295-00	METAL CHIP 0 5% 1/10W	(ED60/ED70/EZ70)
		< SWITCH >	
S461	1-762-196-21	SWITCH, TACT (I/ ⏻)	
S462	1-762-196-21	SWITCH, TACT (SYNCHRO REC)	(ED40/ED70/EZ70)

Ref. No.	Part No.	Description	Remark
*	A-6791-591-A	NK-11 BOARD, COMPLETE (ED70/EZ70: NZ) *********************	(Ref.No.2,000 Series)
		< CAPACITOR >	
C003	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C004	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C005	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C006	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C007	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C008	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C009	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C010	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C011	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C012	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C013	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	
C014	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C015	1-163-229-11	CERAMIC CHIP 12PF 5% 50V	
C016	1-163-222-11	CERAMIC CHIP 5PF 0.25PF 50V	
C017	1-110-501-11	CERAMIC CHIP 0.33uF 10% 16V	
C018	1-163-989-11	CERAMIC CHIP 0.033uF 10% 25V	
C019	1-109-982-11	CERAMIC CHIP 1uF 10% 10V	
C020	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C021	1-113-642-11	TANTAL. CHIP 47uF 10% 10V	
C022	1-107-823-11	CERAMIC CHIP 0.47uF 10% 16V	
C023	1-163-243-11	CERAMIC CHIP 47PF 5% 50V	
		< CONNECTOR >	
* CN001	1-691-183-11	CONNECTOR (BOARD TO BOARD) 13P	
		< DIODE >	
D001	8-719-066-72	DIODE BB135	
		< FERRITE BEAD >	
FB001	1-543-813-21	FERRITE 0uH	
FB002	1-543-813-21	FERRITE 0uH	
FB003	1-543-813-21	FERRITE 0uH	
		< IC >	
IC001	8-759-526-43	IC TDA9874H/V1,118	
		< COIL >	
L006	1-412-945-11	INDUCTOR 3.3uH	
		< IC LINK >	
⚠PS001	1-576-122-21	LINK, IC (400mA)	

The components identified by mark ⚠or dotted line with mark ⚠are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R001	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R002	1-216-073-00	METAL CHIP	10K	5%	1/10W
R003	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R004	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
R005	1-216-041-00	METAL CHIP	470	5%	1/10W
R006	1-216-041-00	METAL CHIP	470	5%	1/10W
R007	1-216-001-00	METAL CHIP	10	5%	1/10W
R008	1-216-001-00	METAL CHIP	10	5%	1/10W
R009	1-216-001-00	METAL CHIP	10	5%	1/10W
R010	1-216-001-00	METAL CHIP	10	5%	1/10W
R011	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R012	1-216-304-11	METAL CHIP	3.3	5%	1/10W
R013	1-216-001-00	METAL CHIP	10	5%	1/10W
R014	1-216-295-00	METAL CHIP	0	5%	1/10W
R015	1-216-295-00	METAL CHIP	0	5%	1/10W
R016	1-216-033-00	METAL CHIP	220	5%	1/10W
		< VIBRATOR >			
X001	1-767-897-11	VIBRATOR, CRYSTAL (24.576MHz)			

Ref. No.	Part No.	Description			Remark
	1-468-312-12	POWER BLOCK (HS-921SF) (ED10)			
	1-468-312-22	POWER BLOCK (HS-921SF1) (ED40/ED60/ED70)			
		************************			
		(Ref.No. 3,000 Series)			
		< CAPACITOR >			
⚠C101	1-115-165-11	FILM	0.1uF		250V
⚠C102	1-115-165-11	FILM	0.1uF		250V
⚠C108	9-980-012-01	ELECT	150uF		450V
C207	1-126-964-11	ELECT	10uF		50V
C401	1-126-967-11	ELECT	47uF		50V
		< DIODE >			
⚠D102	8-719-312-16	DIODE EG01			
⚠D104	8-719-026-52	DIODE 10ELS2			
⚠D106	8-719-100-30	DIODE RD12ES			
⚠D201	8-719-018-83	DIODE D2S4M			
⚠D401	8-719-052-89	DIODE D1NL40			
⚠D501	8-719-026-52	DIODE 10ELS2			
		< FUSE >			
⚠F101	1-532-388-31	FUSE (2.0A/250V)			
		< IC >			
⚠IC101	9-939-634-01	IC MIP-164			
⚠IC201	8-759-420-19	IC AN1431T			
		< PHOTO COUPLER >			
⚠PC101	8-749-924-84	COUPLER, PHOTO PS2561			

Ref. No.	Part No.	Description			Remark
	1-468-311-11	POWER BLOCK (SR-718) (EZ10)			
	1-468-311-21	POWER BLOCK (SR-708) (EZ40/EZ60/EZ70)			
		********************			
		(Ref.No. 4,000 Series)			
		< CAPACITOR >			
C112	1-130-495-51	FILM	0.1uF		50V
C114	1-130-495-51	FILM	0.1uF		50V
C115	1-130-495-51	FILM	0.1uF		50V
		< DIODE >			
⚠D107	9-900-534-01	DIODE ERA18-02			
⚠D108	9-900-534-01	DIODE ERA18-02			
D205	9-900-534-01	DIODE ERA18-02			
		< FUSE >			
⚠F101	1-532-388-31	FUSE (2.0A/250V)			
		< IC >			
⚠IC201	8-759-420-19	IC AN1431T			
		< PHOTO COUPLER >			
⚠PC101	8-749-924-84	COUPLER, PHOTO PS2561			
		< RESISTOR >			
⚠R208	9-908-233-01	FUSIBLE	0.47		1/4W

Ref. No.	Part No.	Description			Remark
*	A-6791-858-A	RJ-82 BOARD, COMPLETE (ED60/ED70)			
*	A-6791-864-A	RJ-82 BOARD, COMPLETE (EZ60)			
*	A-6791-867-A	RJ-82 BOARD, COMPLETE (ED40)			
*	A-6791-876-A	RJ-82 BOARD, COMPLETE (EZ70: AS)			
*	A-6791-879-A	RJ-82 BOARD, COMPLETE (EZ70: NZ)			
		*********************			
		(Ref.No.1,000 Series)			
		< CAPACITOR >			
C951	1-126-160-11	ELECT	1uF	20%	50V (ED40/ED60/ED70/EZ70: AS)
C952	1-126-160-11	ELECT	1uF	20%	50V (ED40/ED60/ED70/EZ70: AS)
C960	1-126-925-11	ELECT	470uF	20%	10V (EZ70: NZ)
C961	1-109-982-11	CERAMIC CHIP	1uF	10%	10V (EZ70: NZ)
C962	1-164-505-11	CERAMIC CHIP	2.2uF		16V (EZ70: NZ)
C963	1-124-589-11	ELECT	47uF	20%	16V (EZ70: NZ)
		< CONNECTOR >			
* CN951	1-568-948-11	PIN, CONNECTOR 10P (ED60/ED70/EZ70: AS)			
* CN952	1-568-942-21	PIN, CONNECTOR 4P (ED40)			
* CN953	1-568-942-11	PIN, CONNECTOR 4P (EZ60/EZ70: NZ)			
* CN954	1-568-943-11	PIN, CONNECTOR 5P (EZ70: NZ)			
		< JACK >			
CNJ951	1-565-726-11	JACK, PIN 3P (LINE-3 IN (SAT IN))			(ED60/ED70/EZ70: AS)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
CNJ951	1-784-817-11	JACK, PIN 3P (LINE-3 IN (SAT IN)) (ED40)	
CNJ952	1-784-816-11	JACK, PIN 2P (LINE-2 OUT (AUDIO)) (ED60/ED70/EZ60/EZ70)	
CNJ953	1-784-818-11	JACK, PIN 2P (SAT DEC) (EZ70: NZ)	
		< DIODE >	
D951	1-216-295-00	METAL CHIP 0 5% 1/10W (EZ70: NZ)	
D951	8-719-017-09	DIODE 02DZ6.2-TPH3 (ED40/ED60/ED70/EZ70: AS)	
D952	8-719-017-09	DIODE 02DZ6.2-TPH3 (EZ70: NZ)	
		< ENCAPSULATED COMPONENT >	
FL951	1-236-163-11	ENCAPSULATED COMPONENT (EZ70: AS)	
FL952	1-236-163-11	ENCAPSULATED COMPONENT (EZ70: AS)	
		< IC >	
IC951	8-759-433-44	IC MM1031XML (EZ70: NZ)	
		< JUMPER RESISTOR >	
JR951	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR953	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR954	1-216-296-00	METAL CHIP 0 5% 1/8W	
JS951	1-216-295-00	METAL CHIP 0 5% 1/10W (ED40/ED60/ED70)	
JS952	1-216-295-00	METAL CHIP 0 5% 1/10W (ED40/ED60/ED70)	
JS954	1-216-295-00	METAL CHIP 0 5% 1/10W (EZ70: NZ)	
JS955	1-216-296-00	METAL CHIP 0 5% 1/8W (ED40/ED60/ED70/EZ60/EZ70: AS)	
JS956	1-216-295-00	METAL CHIP 0 5% 1/10W (EZ70: NZ)	
JS957	1-216-296-00	METAL CHIP 0 5% 1/8W (ED40)	
		< RESISTOR >	
R951	1-216-021-00	METAL CHIP 68 5% 1/10W (ED40/ED60/ED70/EZ70: AS)	
R952	1-216-295-00	METAL CHIP 0 5% 1/10W (ED40/ED60/ED70/EZ70: AS)	
R953	1-216-295-00	METAL CHIP 0 5% 1/10W (ED40/ED60/ED70/EZ70: AS)	
R954	1-216-041-00	METAL CHIP 470 5% 1/10W (ED60/ED70/EZ60/EZ70)	
R955	1-216-041-00	METAL CHIP 470 5% 1/10W (ED60/ED70/EZ60/EZ70)	
R956	1-216-021-00	METAL CHIP 68 5% 1/10W (EZ70: NZ)	
R957	1-216-021-00	METAL CHIP 68 5% 1/10W (EZ70: NZ)	
R958	1-216-097-00	METAL CHIP 100K 5% 1/10W (ED40/ED60/ED70/EZ70: AS)	
R959	1-216-097-00	METAL CHIP 100K 5% 1/10W (ED40/ED60/ED70/EZ70: AS)	

MISCELLANEOUS
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Ref. No.	Part No.	Description	Remark
10	1-790-537-11	CABLE, FLAT (FFC) (FDS-5) (ED10/EZ10)	
52	1-790-536-11	CABLE, FLAT (FFC) (FMD-13) (ED10/EZ10)	
⚠56	1-777-854-21	CORD, POWER (ED10)	
⚠56	1-777-855-22	CORD, POWER (EZ10)	
111	1-790-533-11	CABLE, FLAT (FFC) (FDM-6)	
114	1-790-534-11	CABLE, FLAT (FFC) (FMF-36) (ED60/EZ40/EZ60)	
114	1-790-535-11	CABLE, FLAT (FFC) (FMF-33) (ED40/ED70/EZ70)	
123	1-762-844-21	SWITCH, ROTARY (ED70/EZ70)	
⚠157	1-777-854-21	CORD, POWER (ED40/ED60/ED70)	
⚠157	1-777-855-22	CORD, POWER (EZ40/EZ60/EZ70)	
704	1-500-144-11	HEAD, FE	
768	1-759-453-11	DRUM ASSY DZH-89A-R (ED10/EZ10)	
768	8-839-037-04	DRUM ASSY DZH-74E/Z-RP (ED40/EZ40)	
768	8-839-045-02	DRUM ASSY DZH-95A/Z-RP (ED60/ED70/EZ60/EZ70)	
M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

****
HARDWARE LIST
****

Ref. No.	Part No.	Description	Remark
#1	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3	
#2	7-682-147-01	SCREW +P 3X6	
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3	
#4	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

ACCESSORIES & PACKING MATERIALS
****

Ref. No.	Part No.	Description	Remark
	1-418-159-11	COMMANDER, STANDARD (RMT-V245C) (EZ60)	
	1-418-160-11	COMMANDER, STANDARD (RMT-V248C) (ED10)	
	1-418-161-11	COMMANDER, STANDARD (RMT-V247C) (ED60)	
	1-418-161-21	COMMANDER, STANDARD (RMT-V247D) (ED70)	
	1-475-614-11	COMMANDER, STANDARD (RMT-V245) (EZ70)	
	1-475-614-21	COMMANDER, STANDARD (RMT-V245A) (EZ10/EZ40)	
	1-475-616-11	COMMANDER, STANDARD (RMT-V247) (ED40)	
⚠	1-569-008-21	ADAPTOR, CONVERSION 2P (ED10: ME, SG/ED40: ME, SG/ED60: ME, SG)	
	1-696-593-11	CORD, CONNECTION (PAL) (ANT) 1.5m	
	3-709-128-01	COVER, BATTERY (for RMT-V245/V245A/V245C) (EZ10/EZ40/EZ60/EZ70)	
	3-709-133-11	COVER, BATTERY (for RMT-V247/V245C/V247D) (ED40/ED60/ED70)	
	3-709-322-01	COVER, BATTERY (for RMT-V248C) (ED10)	
	3-865-382-11	MANUAL, INSTRUCTION (ENGLISH) (ED70)	
	3-865-383-11	MANUAL, INSTRUCTION (ENGLISH) (EZ70)	
	3-865-384-11	MANUAL, INSTRUCTION (ENGLISH) (ED60)	
	3-865-384-21	MANUAL, INSTRUCTION (ARABIC) (ED60: ME, SG)	
	3-865-384-31	MANUAL, INSTRUCTION (PERSIAN) (ED60: SG)	
	3-865-384-41	MANUAL, INSTRUCTION (URDU) (ED60: SG)	
	3-865-384-51	MANUAL, INSTRUCTION (RUSSIAN) (ED60: PS, SG)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	3-865-385-11	MANUAL, INSTRUCTION (ENGLISH) (EZ40/EZ60)	
	3-865-386-11	MANUAL, INSTRUCTION (ENGLISH) (ED40)	
	3-865-386-21	MANUAL, INSTRUCTION (ARABIC) (ED40: ME, SG)	
	3-865-386-31	MANUAL, INSTRUCTION (PERSIAN) (ED40: SG)	
	3-865-386-41	MANUAL, INSTRUCTION (URDU) (ED40: SG)	
	3-865-386-51	MANUAL, INSTRUCTION (RUSSIAN) (ED40: PS, SG)	
	3-865-387-11	MANUAL, INSTRUCTION (ENGLISH) (ED10: MPS)	
	3-865-387-12	MANUAL, INSTRUCTION (ENGLISH) (ED10: ME, PS, SG)	
	3-865-387-21	MANUAL, INSTRUCTION (ARABIC) (ED10: ME, SG)	
	3-865-387-31	MANUAL, INSTRUCTION (PERSIAN) (ED10: SG)	
	3-865-387-41	MANUAL, INSTRUCTION (URDU) (ED10: SG)	
	3-865-387-51	MANUAL, INSTRUCTION (RUSSIAN) (ED10: PS, SG)	
	3-865-387-61	MANUAL, INSTRUCTION (SWAHILI) (ED10: PS)	
	3-865-388-11	MANUAL, INSTRUCTION (ENGLISH) (EZ10)	
*	3-961-581-01	SHEET, PROTECTION (ED10/EZ10)	
*	3-979-710-01	SPACER (ED10/EZ10)	

9-921-711-11

Sony Corporation
Home A&V Products Company

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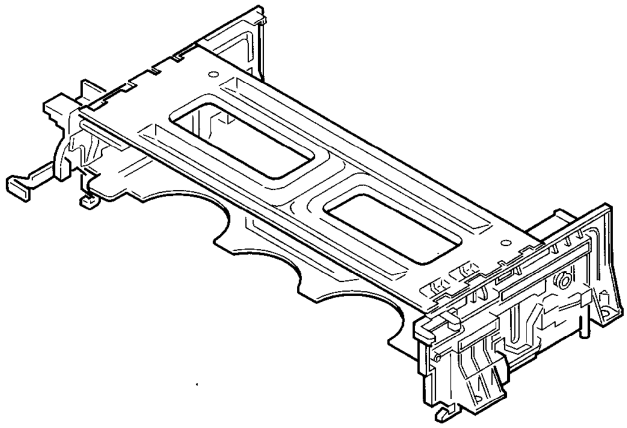
(Shinagawa)

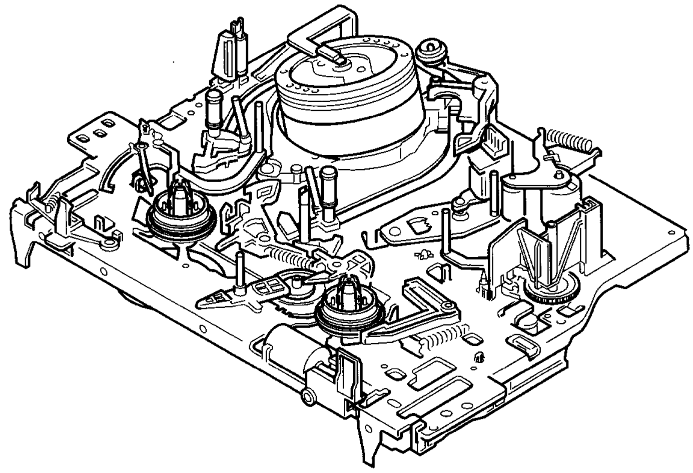
VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ

S MECHANISM

VHS

Please use with the service manual.





VHS TAPE TRANSPORT MECHANISM DECK

MICROFILM

SONY®

ADJUSTMENTS REQUIRED THE FOLLOWING PARTS REPLACEMENT

ADJUSTMENTS		4-1-1	4-1-2	4-1-3	4-1-4	4-1-5	4-1-6	4-1-7	4-1-8
PARTS		TENSION REGULATOR POSITION/TENSION ADJUSTMENT	CHECKING THE TENSION AND TORQUE	X-VALUE ADJUSTMENT	HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6	ACE HEAD HEIGHT AND AZIMUTH ADJUSTMENT	X-VALUE FINE ADJUSTMENT	HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8	CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT
3-25	REEL (S) TABLE	O	Δ	X	Δ	X	X	X	X
3-25	TG1 ASSEMBLY	O	X	X	Δ	X	X	X	X
3-6	FEH ASSEMBLY	X	X	X	Δ	X	X	X	X
3-23	DRUM BASE	X	X	O	O	O	O	O	O
3-2	DRUM ASSEMBLY	X	X	O	O	O	O	O	O
3-24	SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES	X	X	O	O	O	O	O	X
3-5	ACE HEAD BLOCK	X	X	O	Δ	O	O	Δ	X
3-4	CAPSTAN MOTOR	X	X	X	Δ	O	O	O	X
3-3	PINCHI PRESS BLOCK ASS'Y	X	X	X	X	O	O	O	X
3-3	TG8 ASSEMBLY	X	X	X	X	X	X	O	X
3-10	REEL (T) TABLE	X	X	X	X	X	X	Δ	X
3-19	PULLEY GEAR ASSEMBLY	X	O	X	X	X	X	X	X
3-11	PENDULUM ARM ASSEMBLY	X	O	X	X	X	X	X	X

O: ADJUST
Δ: CHECK
X: NOT REQUIRED

1. PREPARATION FOR MECHANISM CHECKS, ADJUSTMENTS AND REPLACEMENT

For removal of the cabinet, printed wiring boards and others, please refer to the service manual "DISASSEMBLY".

1-1. LOADING AND THREADING PROCEDURE WHEN THE POWER TURNS OFF

1-1-1. LOADING AND THREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓐ direction until loading and threading are end.

1-1-2. LOADING AND THREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Applying approx. +9V (300mA) to cam motor with regulated DC power supply makes it loading and threading.

Note : When loading and threading without cassette, claws are caught in four positions as following figure (in the order ①-②-③-④).
So release them with hands.

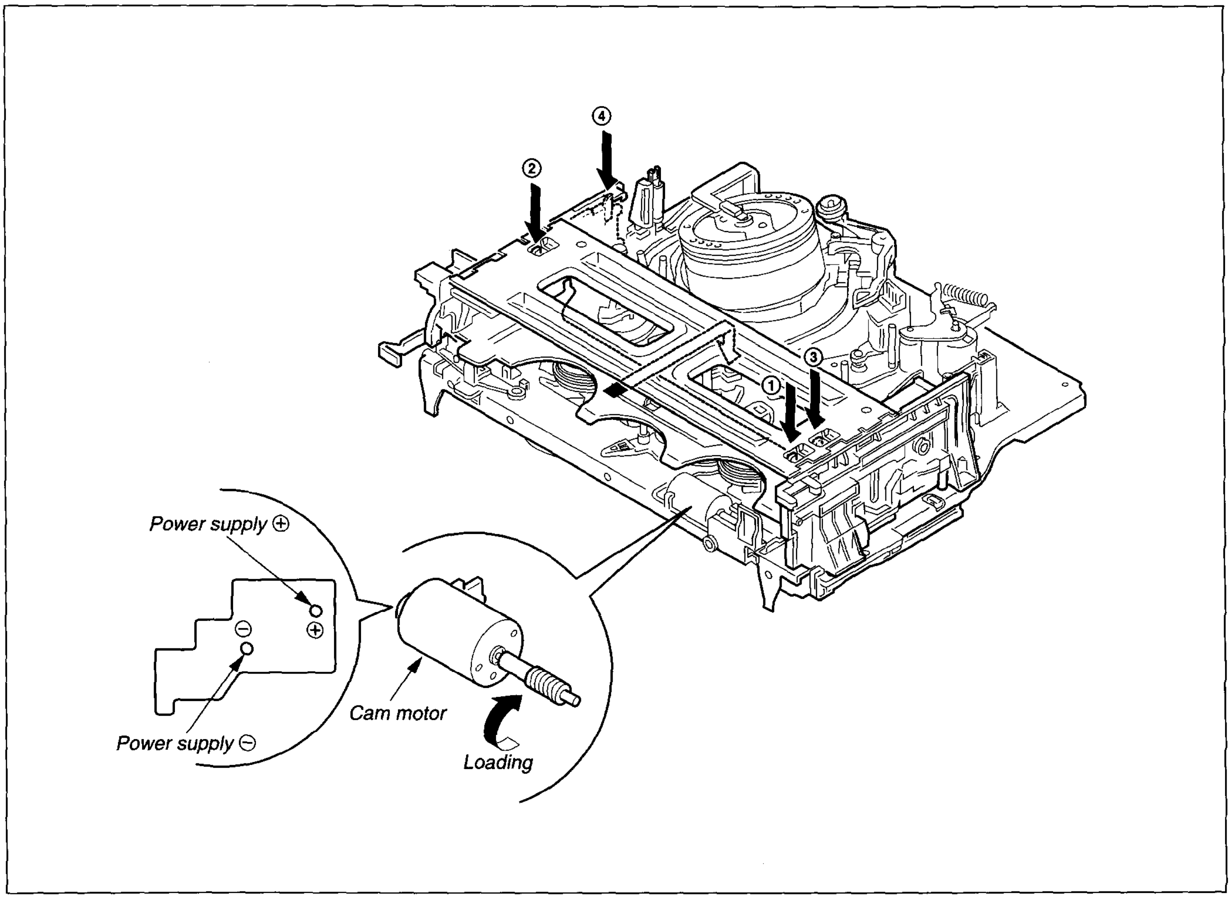


Fig. 1-1

1-2. UNLOADING AND UNTHREADING PROCEDURE WHEN THE POWER TURNS OFF

1-2-1. UNLOADING AND UNTHREADING PROCEDURE WITH HANDS

1) Turn cam motor in the arrow Ⓑ direction until unthreading is end.
2) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.
3) Turn cam motor in the arrow Ⓑ direction until unloading is end.

1-2-2. UNLOADING AND UNTHREADING PROCEDURE WITH REGULATED DC POWER SUPPLY

1) Apply approx. +5V (300mA) to contrary polarities of cam motor.
2) Unthreading operation begins, tape guides return to their initial positions (Unthreading operation is end but tape remains), then stop cam motor by *turning power off.*

Note : When unloading begins and cassette lid is closed, turn cam motor in the arrow Ⓐ direction to open tape guard.

3) Turn capstan motor in the arrow Ⓒ direction to take up tape in cassette.

Note : Take care that tape is not caught at pinch roller.

4) Check that tape is no loosened completely, and apply approx. +5V (300mA) to contrary polarities of cam motor with regulated DC power supply.

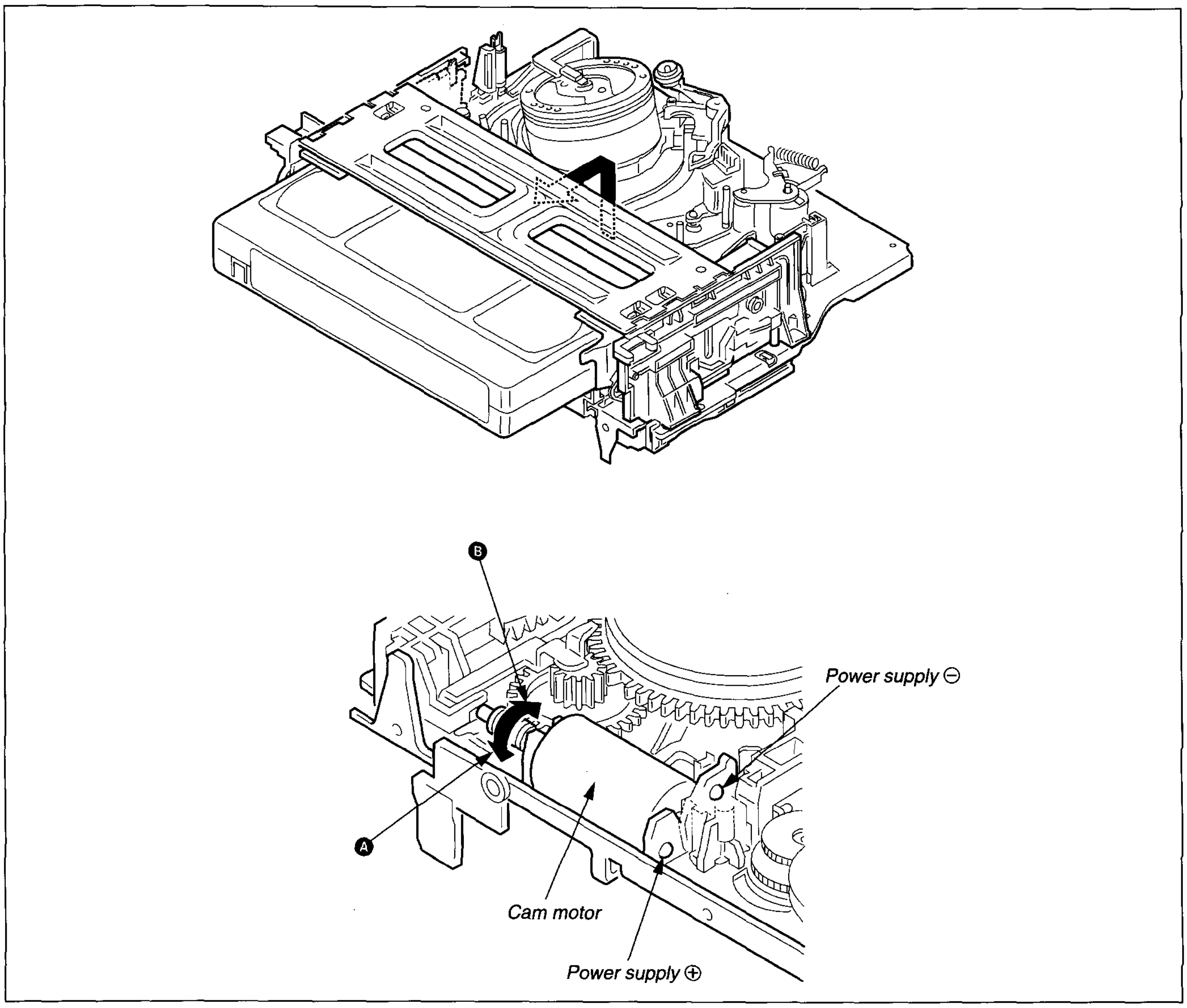


Fig. 1-2

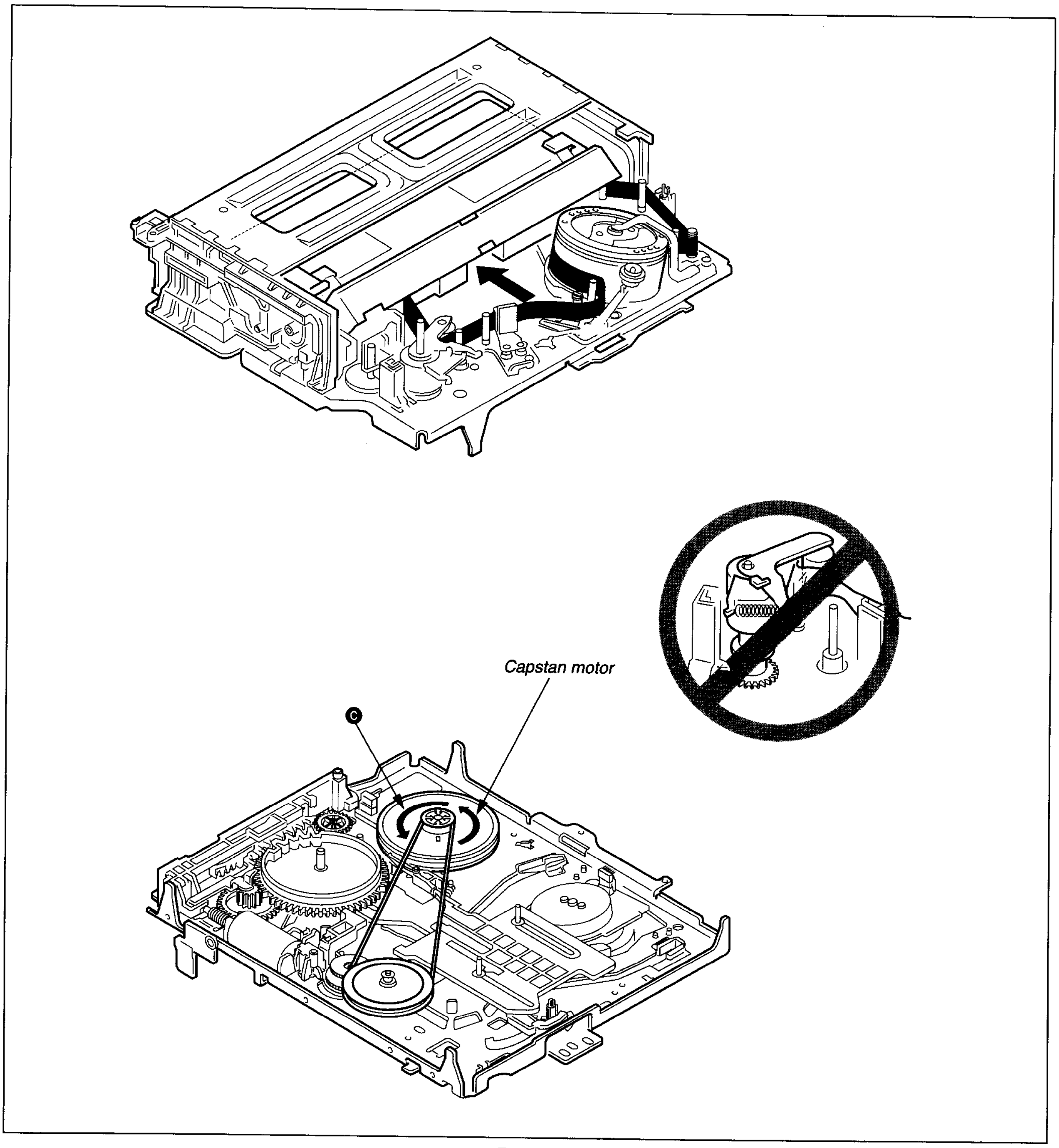

Capstan motor
C

Fig. 1-3

1-3. HOW TO COMPLETE THREADING WITHOUT CASSETTE COMPARTMENT

Note 1 : Put the FL block assembly removed the FL top plate on the bottom not to put dust or grease the top sensor and the end sensor luminous plates or not to scratch them.

1) Pull out AC plug from wall outlet.
2) Shade near the end and top sensors with a black masking tape or the like.
3) Connect AC plug to wall outlet.

Note 2 : In this condition, some modes can not be set.
To make loading in this condition, set the video cassette tape without REC proof claw, pull the REC proof lever once and release it.
On loading without video cassette tape, it is necessary to deceive the microcomputer by turning the reel (T) table with hand.
Fast forward and rewind are not available.

Note 3 : After above mentioned operation, be sure to return the mode in the following order.

4) Pull out AC plug from wall outlet to reset the system control microcomputer.
5) Remove the tape near the end and top sensors.

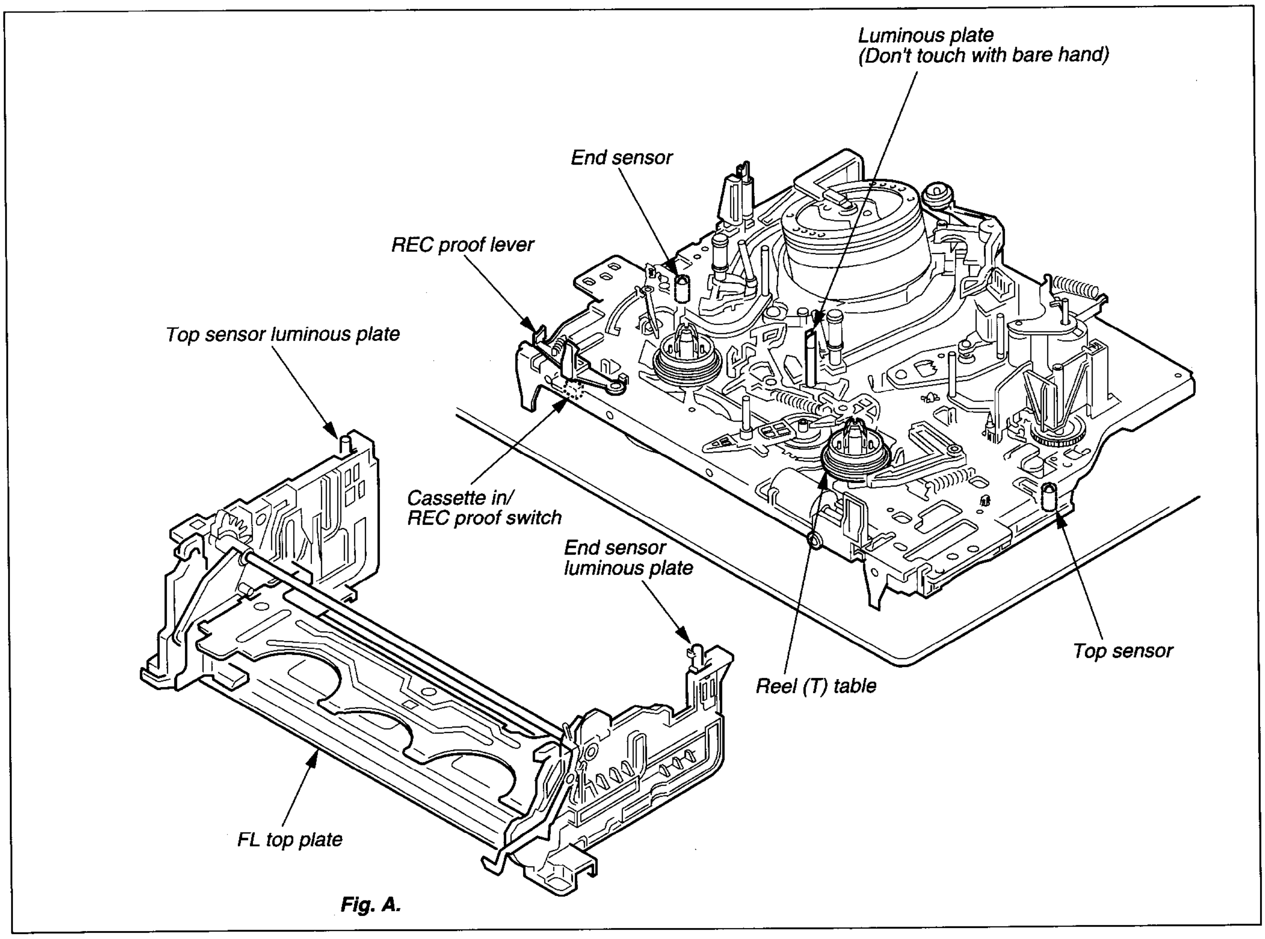

Luminous plate
(Don't touch with bare hand)
End sensor
REC proof lever
Top sensor luminous plate
Cassette in/
REC proof switch
End sensor
luminous plate
Top sensor
Reel (T) table
FL top plate
Fig. A.

Fig. 1-4

2. PERIODIC CHECK AND REPLACEMENT

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

2-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-4) which has been dipped in cleaning fluid (Jig Ref. No. J-3) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by the hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

2-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

2-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that has been dipped in cleaning fluid.

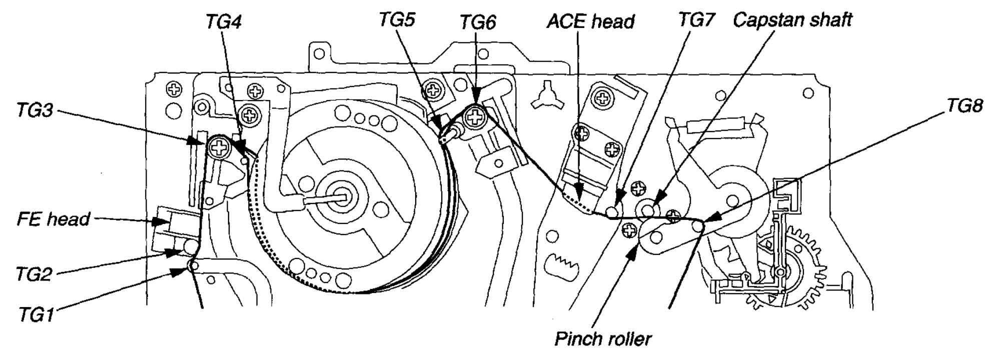


Fig. 2-1 Parts requiring cleaning

2-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users' operating hours.

Maintenance & Check \ Operating Hours (H)		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
Tape Transportation System	Cleaning of tape transportation system	○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning and degaussing of ACE assembly	○	○	○	○	○	○	○	○	○	○	
	Cleaning and degaussing of upper drum assembly	○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Performance Confirmation	Abnormal sound	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section which causes abnormal sound.
	Measurement of FWD back tension	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to 4-1-1. Specified value : Adjust to 5.0504 to 6.5214mN•m (51.5 to 66.5g•cm) (without TC assembly*) or 3.7755 to 5.0994mN•m (38.5 to 52.0g•cm)(with TC assembly*)
	Confirmation of brake system	—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section.
	Confirmation of record and playback functions	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 4.9033 to 8.8259mN•m (50 to 90 g•cm)

○ : Cleaning ☆ : Confirmation

Note : On overhaul
When overhauling the unit, replace parts as indicated in the above table.

2-5. TOOLS AND FIXTURES REQUIRED FOR SERVICING

Ref. No.	Name		Part No.	Caved Jig No.	Remarks
J-1	Torque Measurement Cassette VHT-103S		J-6090-072-A		For FWD & back tension torque measurement.
	Torque Measurement Cassette VHT-404S		J-6082-012-A		For CUE and REVIEW torque measurement.
J-2	Alignment Tape	KRV-52NE* (NTSC)	8-192-605-41		Tape path, Audio azimuth, X-value adjustments
		KRV-51N2 (NTSC)	8-192-605-32		Electrical adjustments, Operation checks
		KRV-52PL (PAL)	8-192-605-46		Tape path, Audio azimuth, X-value adjustments
		KRV-51P (PAL)	8-192-605-36		Electrical adjustments, Operation checks
J-3	Cleaning fluid		Y-2031-001-0	—	
J-4	Chamois Leather		2-034-697-00	—	
J-5	Dental Mirror (With Handle) Dental Mirror (Mirror)		J-6080-029-A J-6080-030-1	SL-5052	Tape path and tape traveling adjustments or checks.
J-6	FLOIL SG-646		7-651-000-44		Net. 20g
J-7	Diamond Oil NT-68		7-661-018-18		
J-8	Screw Lock G (1401B)		7-432-114-11		
J-9	X-value adjusting driver		J-6090-073-A		X-value adjustment
J-10	Mode Selector II		J-6082-282-A	—	For S mechanism stand-alone operation
J-11	Connector Conversion Jig		J-6090-052-A	—	For S mechanism stand-alone operation
J-12	S Type Capstan Board		J-6090-075-A	—	For S mechanism stand-alone operation

* Be sure to use KRV-52NE having version number.

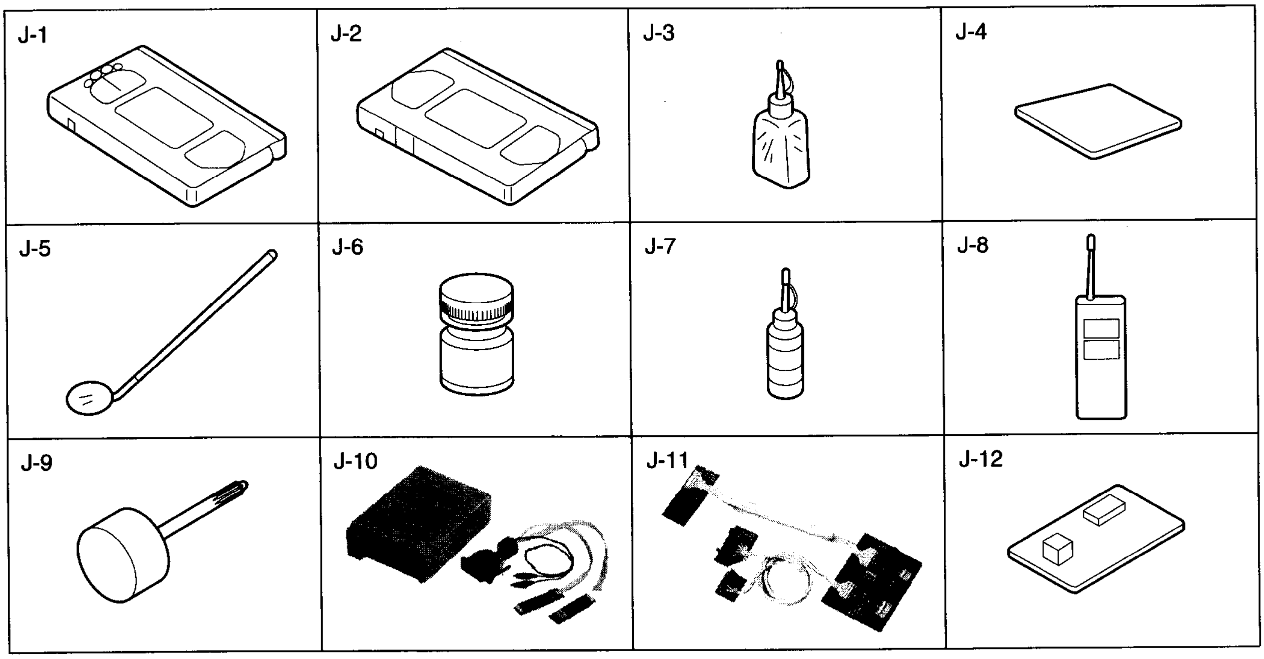


Fig. 2-2

2-6. HOW TO USE THE MODE SELECTOR II FOR ADJUSTING S TYPE MECHANISM ASSEMBLY

2-6-1. OUTLINE

To activate the VHS system S type mechanism assembly using mode selector II (J-6082-282-A), use connector conversion jig (J-6090-052-A) and the S type capstan board (J-6090-075-A). By using the connector conversion jig and the S type capstan board, the following operations are possible.

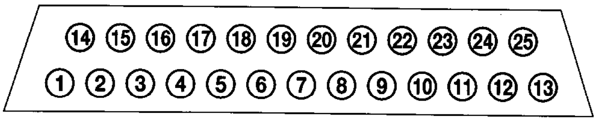
- Loading and unloading action by the loading motor.
- Normal and reverse rotation of the capstan motor.

2-6-2. PREPARATION

1) In order to drive the capstan motor, the power +5V and +12V are supplied from the Mode Selector II. Disassemble the D-SUB connector of the Mode Selector cable, then solder the following three places.

Supplied 3-pin cable	D-SUB connector of the Mode Selector II	Voltage
Pin 1 (Red index)	Pin 20	+12V
Pin 2	Pin 25	GND
Pin 3	Pin 24	+5V

- Connector pin number assignment of the D-SUB connector (From the soldering side)



- When connections are made, check that +5V and +12V are available at the 3-pin cable connector.

2) CHECKING THE SOFTWARE VERSION
Turn on the power of the Mode Selector II.
If the reading of the software version on the Mode Selector II is not 1.10 or higher, replace the new ROM (J-6082-314-A).

2-6-3. CONNECTION

1) S TYPE CAPSTAN BOARD ATTACHMENT
Replace the capstan board supplied with the connector conversion jig (J-6090-052-A) with the S type capstan board (J-6090-075-A).
2) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE MODE SELECTOR II.
Insert the connectors of the two 6-pin cables (one is white and the other is black) and the 3-pin cable from the Mode Selector II to the corresponding connectors on the connector conversion jig (J-6090-052-A).
3) CONNECTION BETWEEN THE CONNECTOR CONVERSION JIG AND THE S TYPE MECHANISM ASSEMBLY
With the power of the Mode Selector II turned off, insert the following two connectors to the corresponding connectors on the S type mechanism assembly.
    - 3-pin connector for the loading motor
    - 10-pin connector for the capstan motor

   Set the speed control for the minimum setting (fully counterclockwise).

2-6-4. OPERATION

1) OPERATION OF THE LOADING MOTOR ON THE S TYPE MECHANISM ASSEMBLY
   ① Select the H type mechanism assembly setting on the Mode Selector II.
   ② Operating procedures after the mechanism selection
   For the operating procedures, see pages 3 to 5 of "8mm Video Mechanical Adjustment Manual IV (TK Mechanism) Supplement-1".
   For the loading procedure, see page 4 of "VHS Mechanical Adjustment manual IV (S Mechanism)".
2) OPERATION OF THE CAPSTAN MOTOR ON THE S TYPE MECHANISM ASSEMBLY
   ① By the loading motor operation under the item 1), change the mode setting to the FF/REW mode.
   ② Turn the speed control gradually in clockwise direction, then the capstan motor starts rotating. To turn the capstan motor in desired rotating direction, change the FF/REW setting of the rotating direction switch.

2-6-5. PRECAUTIONS

- Turn the speed control only when necessary. Otherwise, hold the speed control turned at fully counterclockwise direction. If the power of the Mode Selector II is turned on with the speed control turned in clockwise direction, +12V power fails and the power of the Mode Selector II cannot be turned on.
- Although the connector conversion jig (J-6090-052-A) has rubber feet, do not make a short circuit on the bottom surface of the connector conversion jig via peripheral conductive materials.

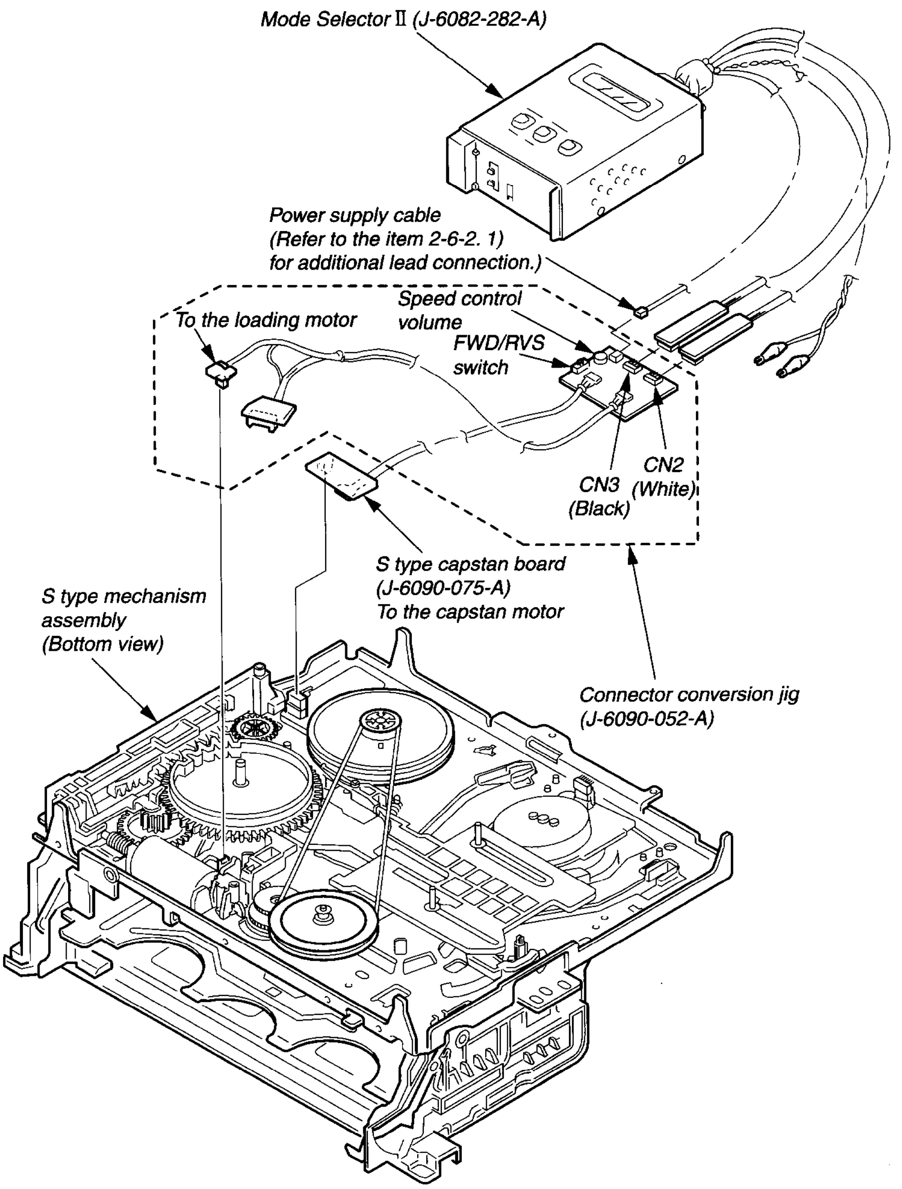

Mode Selector II (J-6082-282-A)
Power supply cable
(Refer to the item 2-6-2. 1)
for additional lead connection.)
Speed control
volume
To the loading motor
FWD/RVS
switch
CN2
(White)
CN3
(Black)
S type capstan board
(J-6090-075-A)
To the capstan motor
S type mechanism
assembly
(Bottom view)
Connector conversion jig
(J-6090-052-A)

Fig. 2-3

2-6-6. CHECKING THE MECHANISM MODE BY THE MARK CARVED ON THE SLIDER

As shown in the right figure, the mechanism mode can be identified by checking the mark carved on the slider pointed by the loading gear shaft.

Carved mark	Mode
CD	Cassette down
EJ	Eject
UL	Unload end
LE	Load end
RV	Reverse
PR	Pinch release
FP	FWD pause
FW	FWD
ST	Stop
FR	FF/REW

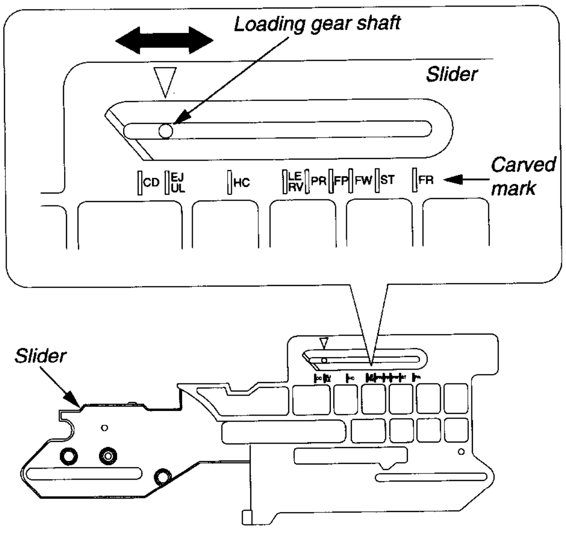
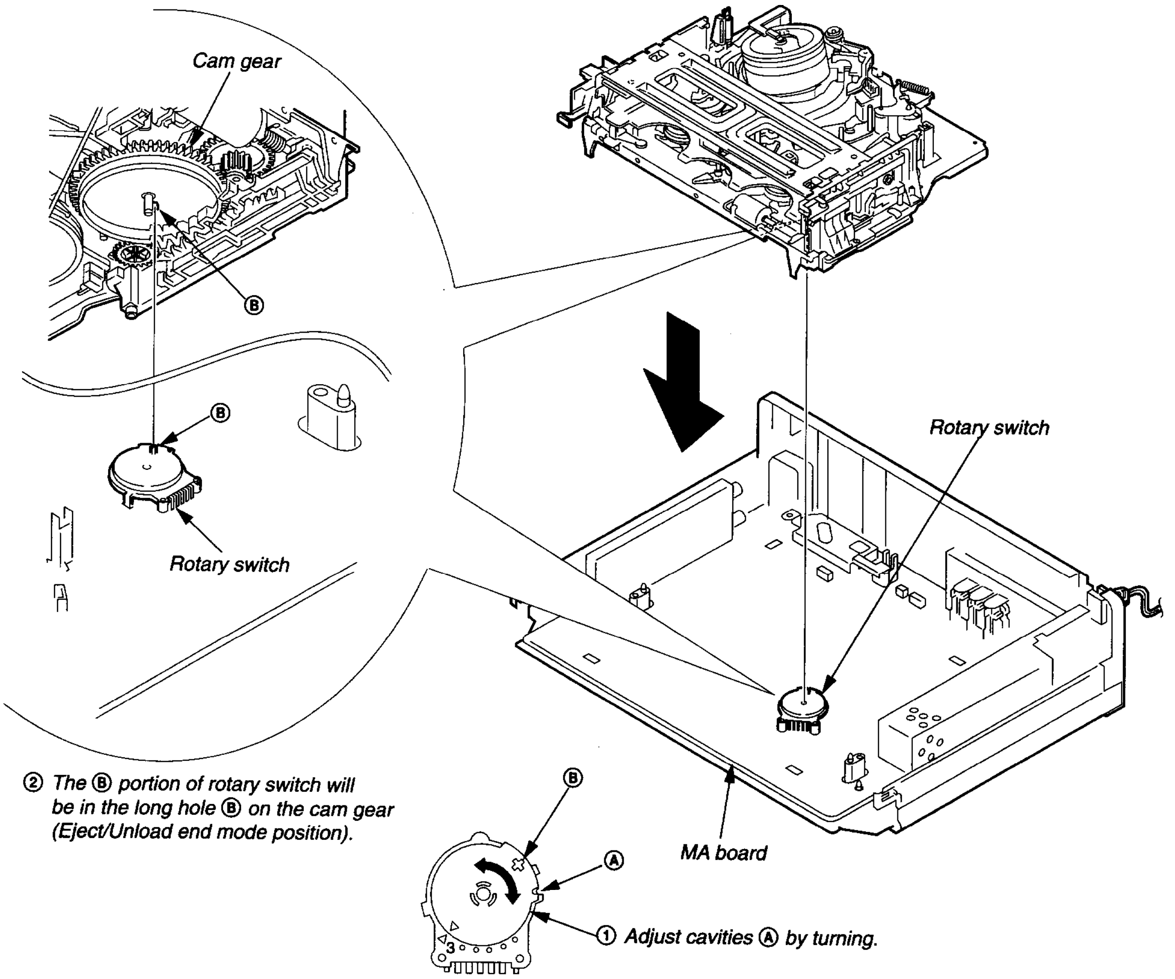

Loading gear shaft
Slider
CD
EJ
UL
HC
LE
RV
PR
FP
FW
ST
FR
Carved
mark
Slider

Fig. 2-4

2-7. PHASE ADJUSTMENT ON ATTACHING S TYPE MECHANISM ASSEMBLY

As shown below, adjust the phase between the rotary switch on the MA board and the cam gear.


Cam gear
Ⓑ
Ⓑ
Rotary switch
Rotary switch
Ⓑ
Ⓐ
MA board

② The Ⓑ portion of rotary switch will be in the long hole Ⓑ on the cam gear (Eject/Unload end mode position).

① Adjust cavities Ⓐ by turning.

Fig. 2-5

3. MAINLY MECHANICAL PARTS REPLACEMENT

Notes:

For the removal of cabinets, printed circuit boards or the like, please refer to the "DISASSEMBLY" section on the service manual of the respective models.

To assemble the mechanical parts which are disassembled in the following sections, perform the disassembly steps in reverse, unless otherwise specified.

When replacing greased parts, grease them in the same way.

Do not oil, grease or touch with bare hands the surfaces that contacts tape of guides and brake shoes.

Install gears to engage each other.

Basically, disassembling and assembling should be done in the unthreading-end condition.

3-1. FL COMPLETE ASSEMBLY

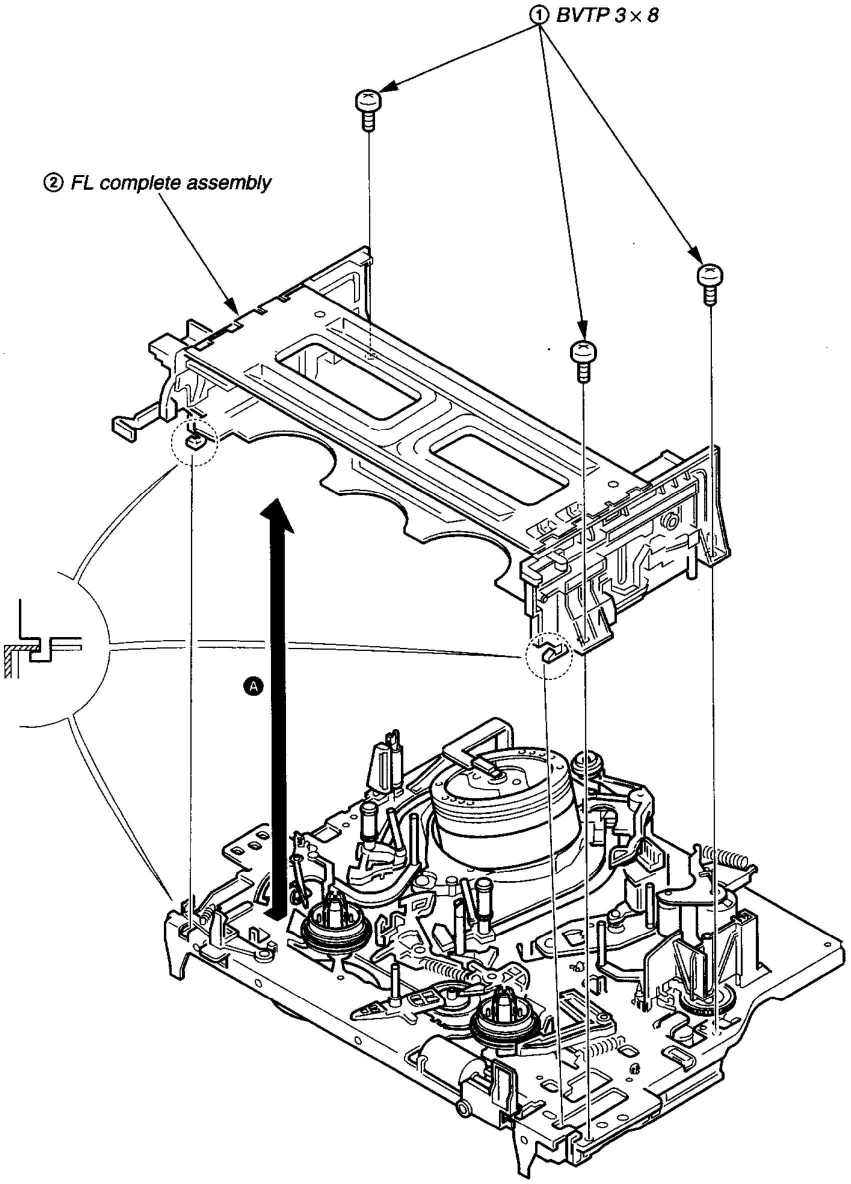
1) Remove screws (BVTP3 × 8) ①.
2) Remove FL complete assembly ② in the arrow Ⓐ direction.

Note : Be careful not to damage claws on the bottom and front.

3) Remove torsion spring (deck open) ③.
4) Remove luminous plate (top sensor) ④ and luminous plate (end sensor) ⑤.

[Note on Mounting]

- When mounting FL complete assembly, first insert claws on the bottom and front not to damage.
- Keep clean top sensor and end sensor luminous plates.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-1

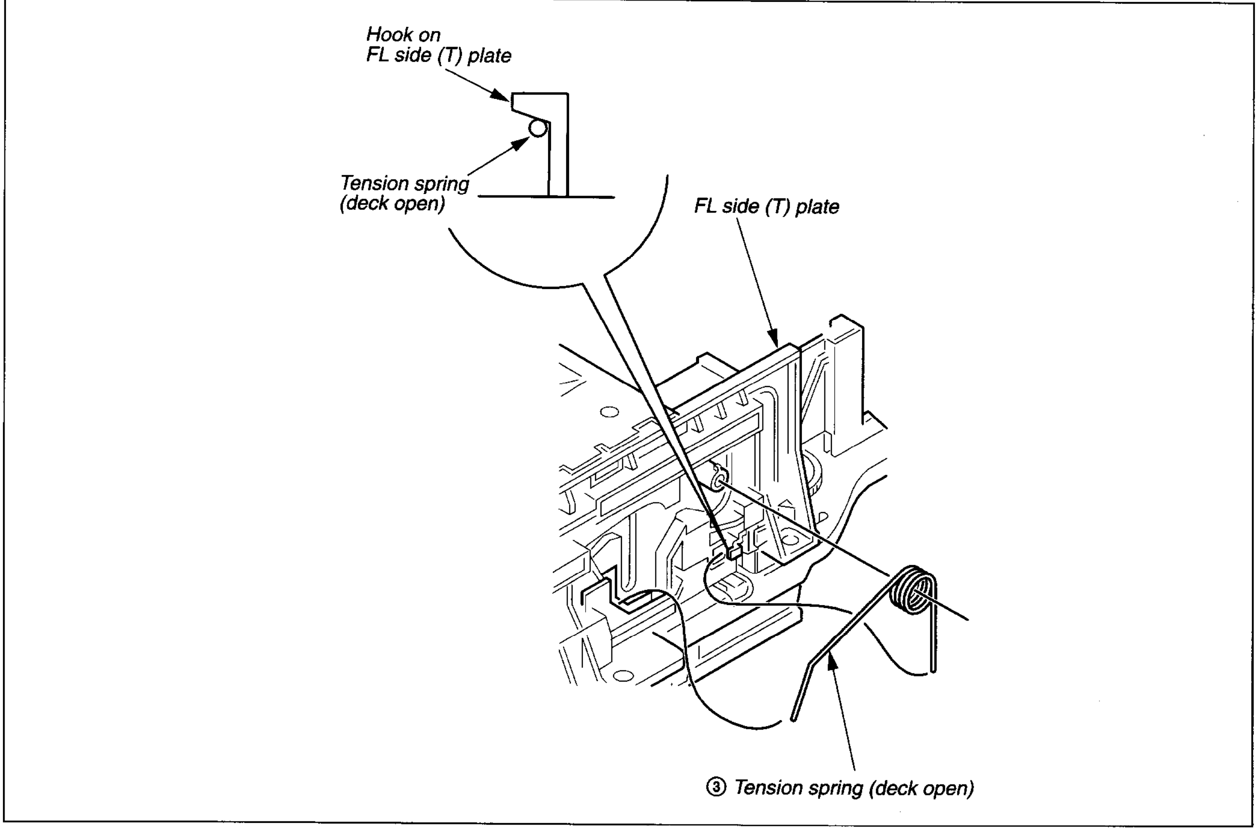

Hook on
FL side (T) plate
Tension spring
(deck open)
FL side (T) plate
③ Tension spring (deck open)

Fig. 3-2

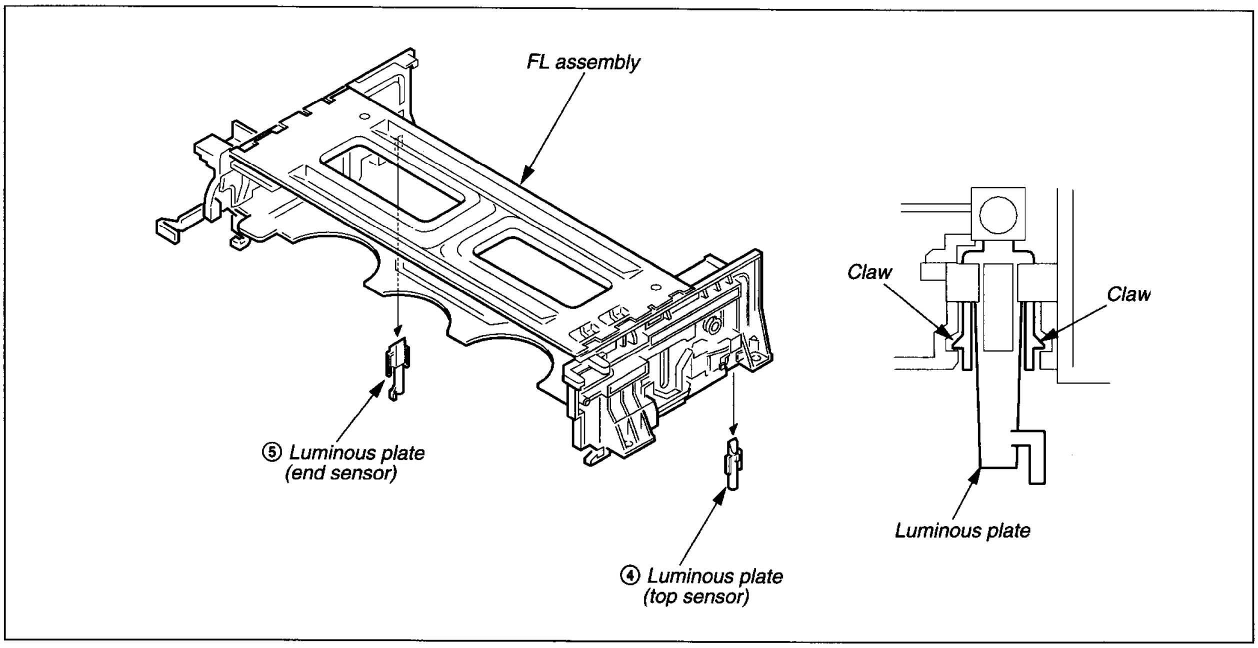

FL assembly
⑤ Luminous plate
(end sensor)
④ Luminous plate
(top sensor)
Claw
Claw
Luminous plate

Fig. 3-3

3-2. DRUM ASSEMBLY

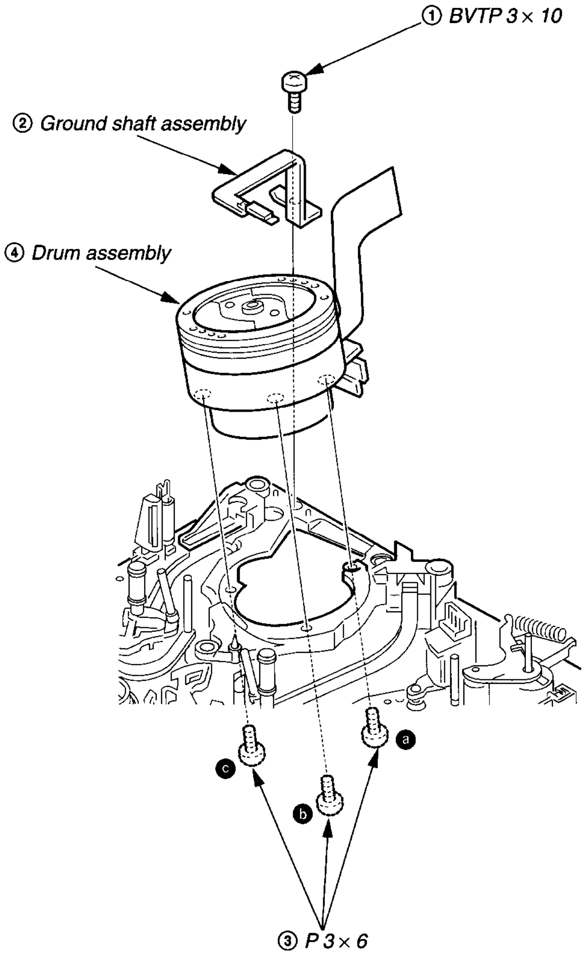
1) Remove screw (BVTP3 × 8) ①.
2) Remove ground shaft assembly ② not to touch its tip with bare hand.
3) Remove screws ③ to remove drum assembly ④.

[Notes on Mounting]

- Don't touch head chips and tip of ground shaft assembly with bare hand.
- Keep clean the surface that contacts tape of drum assembly.
- Tighten screw ③ in the order ⓐ, ⓑ, ⓒ.

[Adjusting after Mounting]

- 4-1. Tape path adjustment



① BVTP 3 × 10
② Ground shaft assembly
④ Drum assembly
ⓐ
ⓑ
ⓒ
③ P 3 × 6

Screw tightening torque
①, ③ : 0.4413 ± 0.0490N•m (4.5 ± 0.5kg•cm)

Fig. 3-4

3-3. PINCH PRESS BLOCK ASSEMBLY, TG8 ASSEMBLY AND THEIR PERIPHERY

1) Remove pinch press block assembly ① while releasing its tip from the claw of lid opener ②.
2) Remove lid opener ② while releasing claw in the arrow 🅐 direction from mechanical chassis.
3) Remove elevator gear ③.
4) Remove TG8 assembly ④, TG8 arm gear ⑤ and TG8 arm driving gear ⑥.
5) Then remove pinch pressing gear ⑦.

[Notes on Mounting]

- When attaching pinch pressing gear ⑦ and elevator gear ③, be sure to adjust their phases as shown in Fig. A.
- Apply grease to elevator gear ⑦ and pinch shaft as shown in Fig. B.
- Don't touch surface of pinch roller with bare hand.

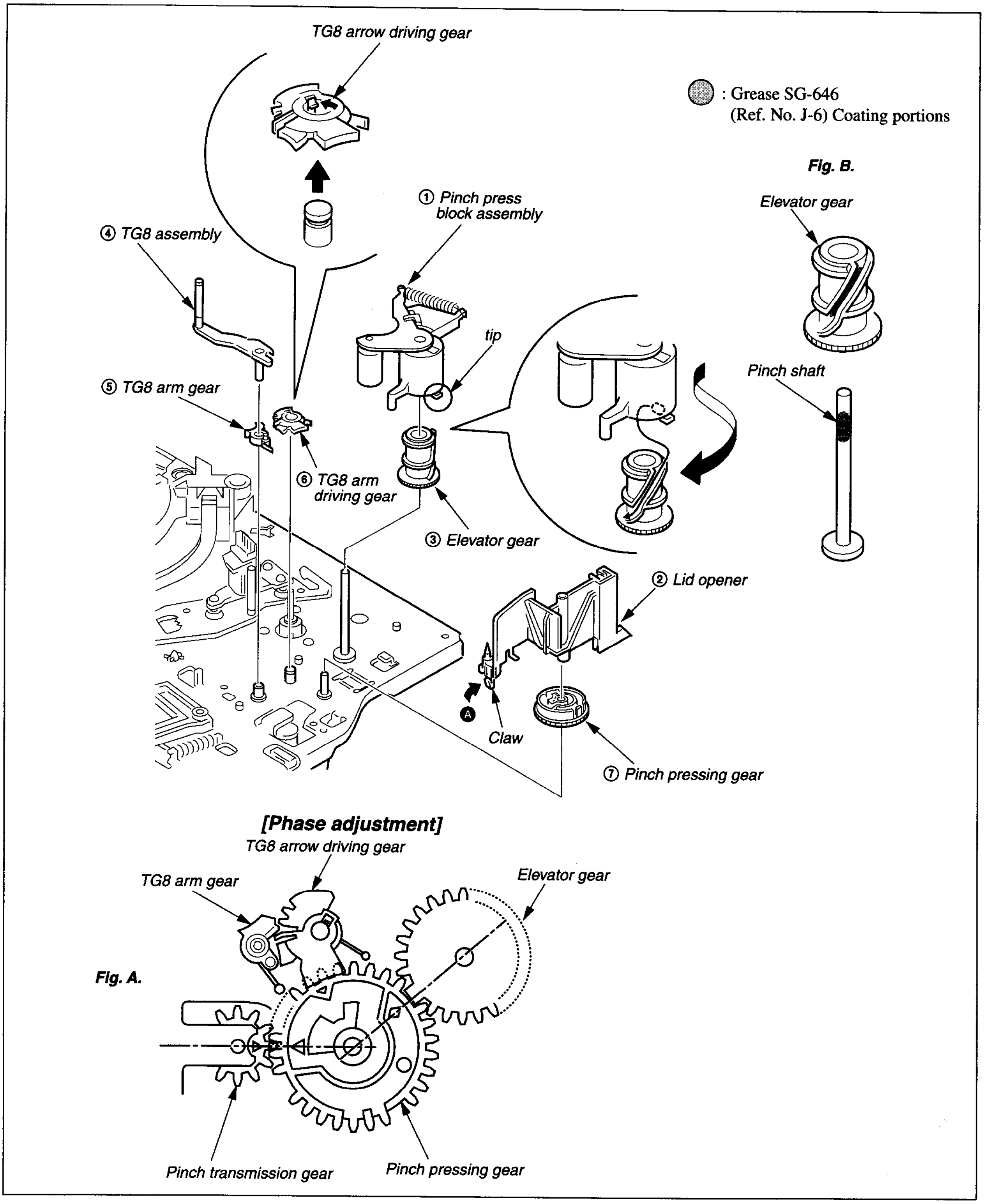

TG8 arrow driving gear
● : Grease SG-646
(Ref. No. J-6) Coating portions
Fig. B.
Elevator gear
① Pinch press block assembly
④ TG8 assembly
tip
Pinch shaft
⑤ TG8 arm gear
⑥ TG8 arm driving gear
③ Elevator gear
② Lid opener
🅐
Claw
⑦ Pinch pressing gear
[Phase adjustment]
TG8 arrow driving gear
TG8 arm gear
Elevator gear
Fig. A.
Pinch transmission gear
Pinch pressing gear

Fig. 3-5

3-4. RUBBER BELT, CAPSTAN MOTOR

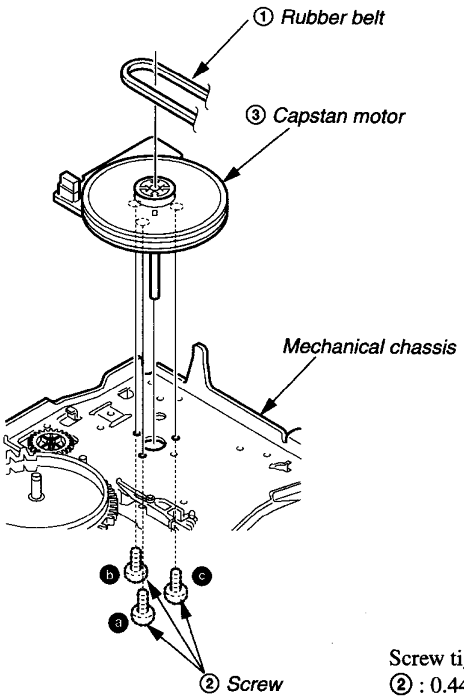
1) Remove rubber belt ①.
2) Remove screws ② to pull out capstan motor ③.

[Notes on Mounting]

- Attach rubber belt not to twist it.
- Don't touch capstan motor with bare hand to keep clean capstan motor.
- Tighten screws ② in the order ⓐ, ⓑ, ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.


① Rubber belt
③ Capstan motor
Mechanical chassis
ⓑ
ⓒ
ⓐ
② Screw

Screw tightening torque
② : 0.4413 ± 0.0490N•m (4.5 ± 0.5kg•cm)

Fig. 3-6

3-5. ACE HEAD BLOCK ASSEMBLY

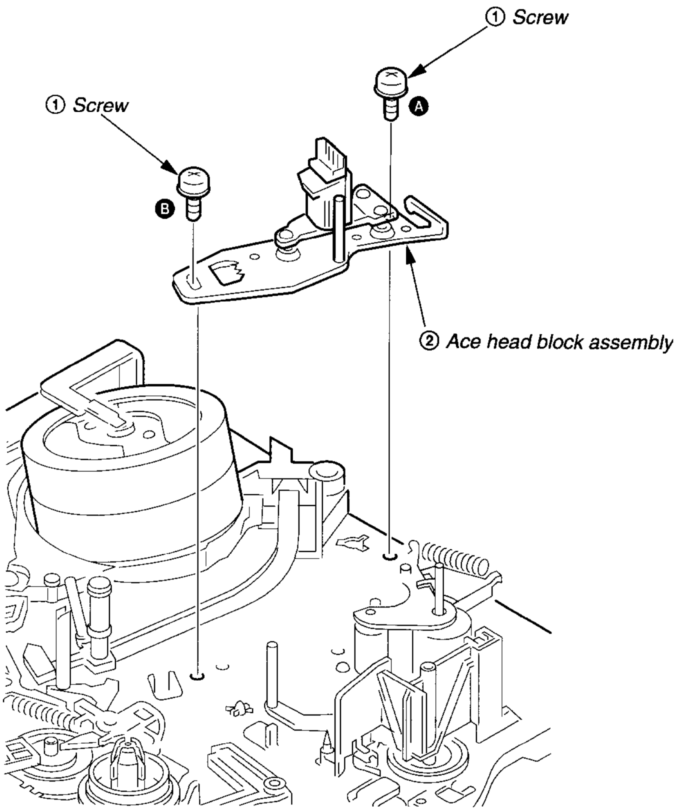
1) Remove screws ① to remove ACE head block assembly ②.

[Notes on Mounting]

- Don't touch capstan motor with bare hand to keep clean capstan motor.
- On tightening screws ①, first, tighten in the order Ⓐ, Ⓑ, next loosen Ⓑ 180 degrees or more and perform adjustments. After adjustments tighten with torque screwdriver (torque; 0.29 ± 0.29 N•m (3.0 ± 0.3kg•cm)).

[Adjustment after Mounting]

- 4-1. Tape path adjustment.



Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-7

3-6. FEH ASSEMBLY

1) While putting the boss out from mechanical chassis, turn FEH assembly ① in the arrow Ⓐ direction and pull out FEH assembly above.
2) Slide FE head ② out from FEH holder not to break claw (Recorder only).
3) Remove TG2 shaft ③ by pushing with a screwdriver covered with cloth or the like not to scratch the surface.

[Note on Mounting]

- Don't touch FE head and TG2 shaft with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment.

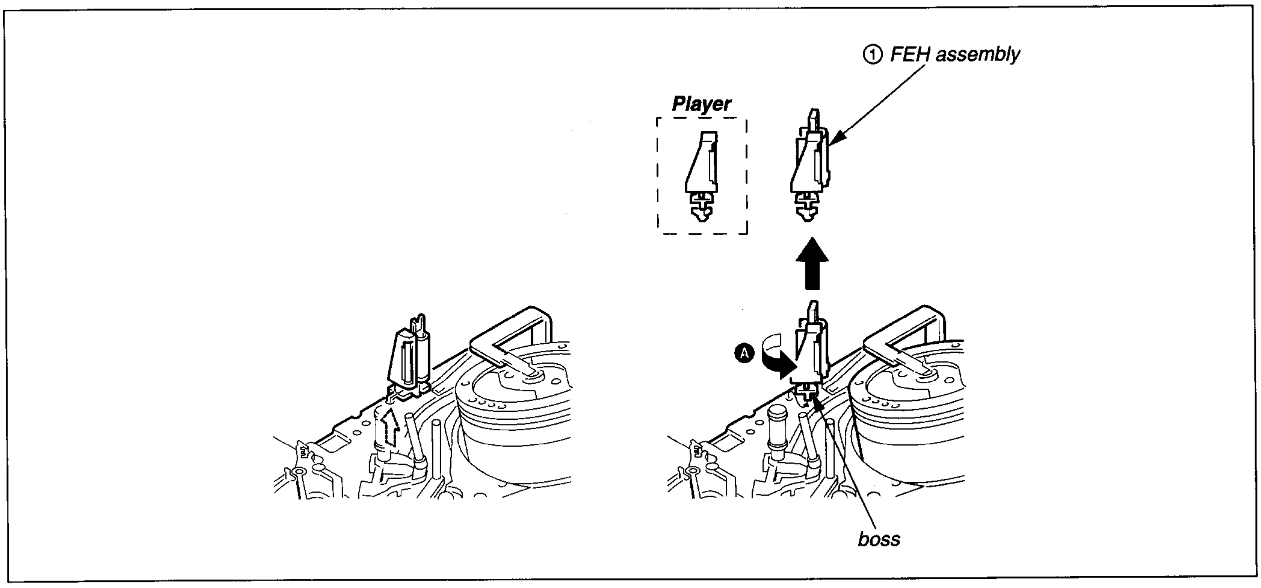

① FEH assembly
Player
Ⓐ
boss

Fig. 3-8

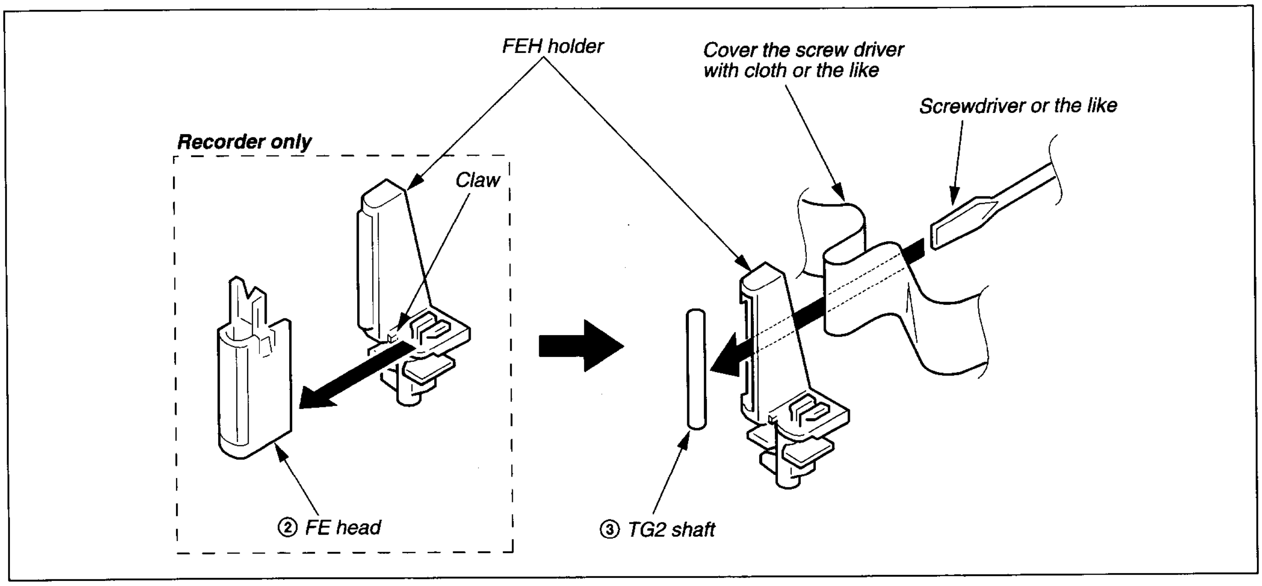

FEH holder
Cover the screw driver with cloth or the like
Screwdriver or the like
Recorder only
Claw
② FE head
③ TG2 shaft

Fig. 3-9

3-7. REC PROOF LEVER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove tension spring (REC proof) ①.
3) Remove REC proof lever ② in the arrow Ⓑ by pushing claw in the arrow Ⓐ direction.

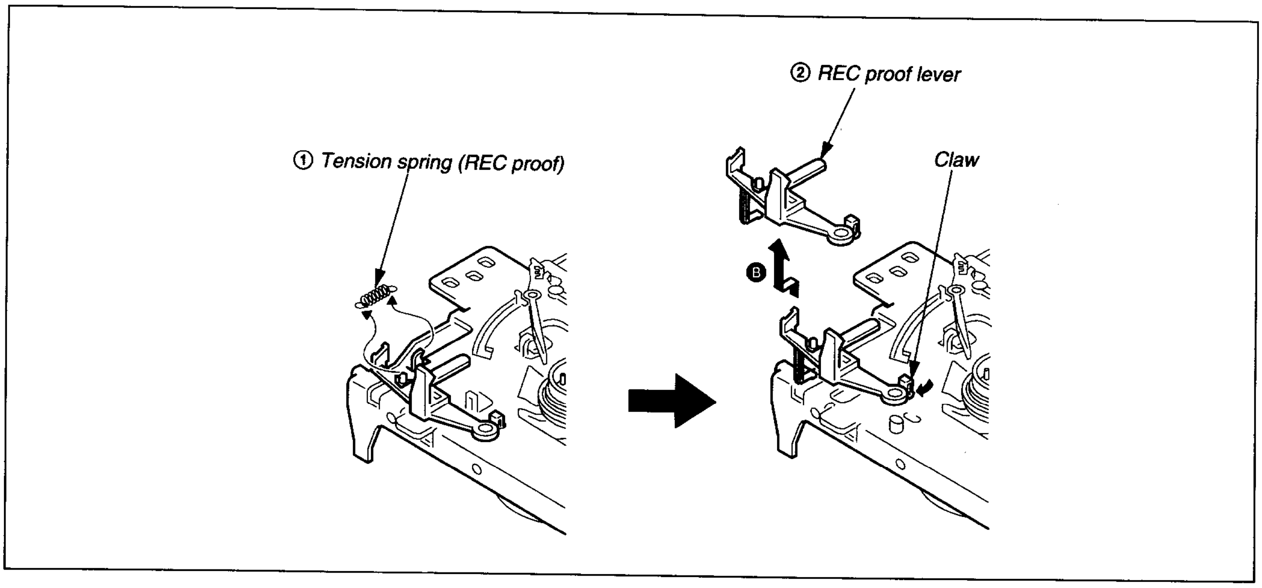

② REC proof lever
① Tension spring (REC proof)
Claw
Ⓑ

Fig. 3-10

3-8. RVS BRAKE ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (RVS brake) ①.
3) Turn RVS brake arm assembly ② in the arrow Ⓐ direction and remove it in the arrow Ⓑ.

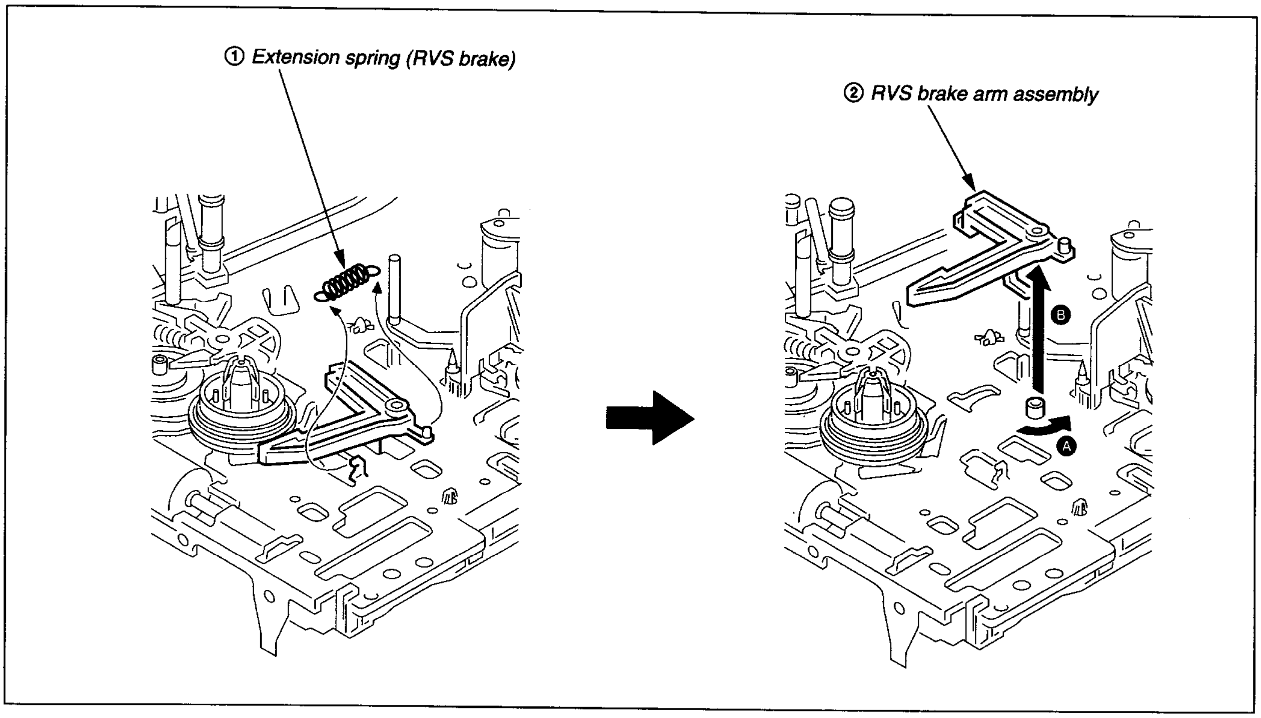
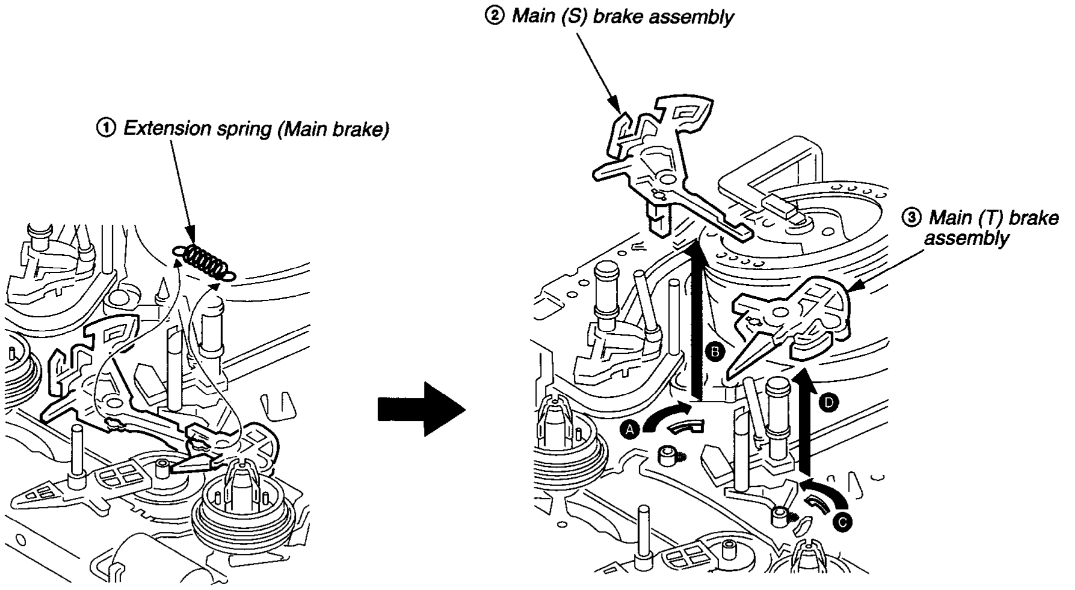

① Extension spring (RVS brake)
② RVS brake arm assembly
Ⓑ
Ⓐ

Fig. 3-11

3-9. MAIN (S) AND MAIN (T) BRAKE ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove extension spring (main brake) ①.
3) Turn main (S) brake assembly ② in the arrow 🅐 direction and remove it in the arrow 🅑.
4) Turn main (T) brake assembly ③ in the arrow 🅒 direction and remove it in the arrow 🅓.


② Main (S) brake assembly
① Extension spring (Main brake)
③ Main (T) brake assembly
B
A
D
C

● : Grease SG-646
(Ref. No. J-6) Coating portions

Fig. 3-12

3-10. REEL (T) TABLE (BLACK)

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove stopper washer ① to pull reel (T) table ② out.
3) Remove thrust washer ③.

[Note on Mounting]

- Before attaching, confirm the oil is applied at the top of reel (T) shaft.

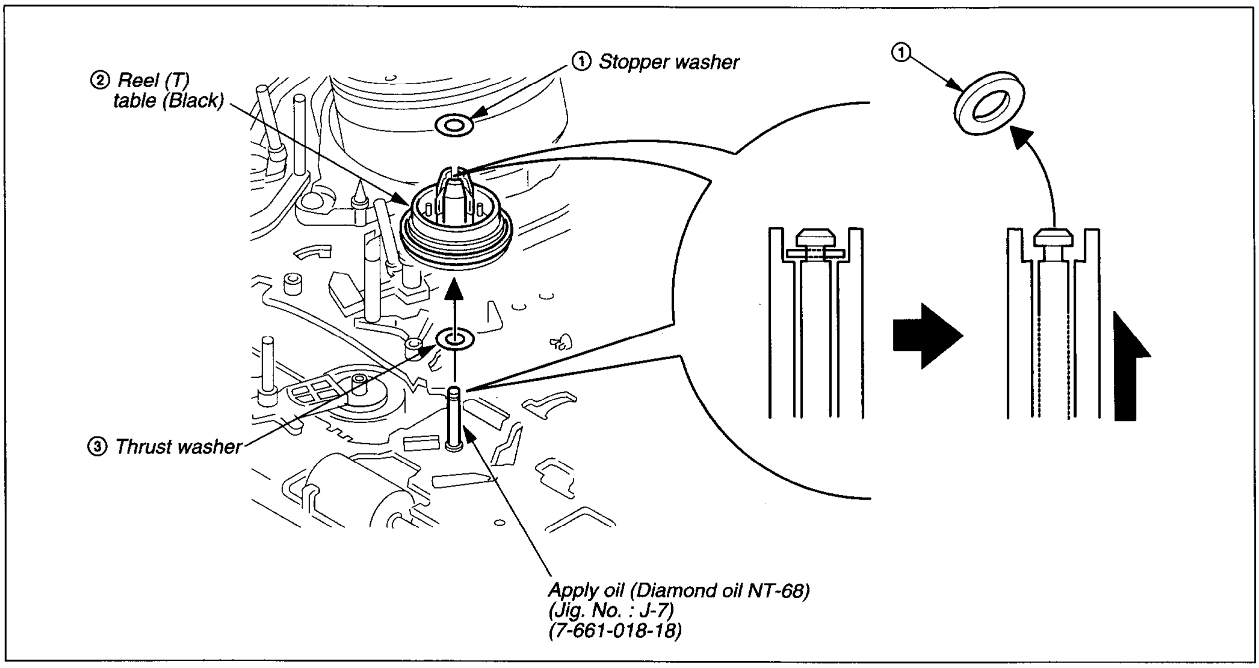

② Reel (T) table (Black)
① Stopper washer
①
③ Thrust washer
Apply oil (Diamond oil NT-68)
(Jig. No. : J-7)
(7-661-018-18)

Fig. 3-13

3-11. PENDULUM ARM ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove main (S) and main (T) brake assemblies. (Refer to 3-9.)
3) While releasing claws from the pendulum arm shaft in the arrow A direction, pull out pendulum arm assembly ①.

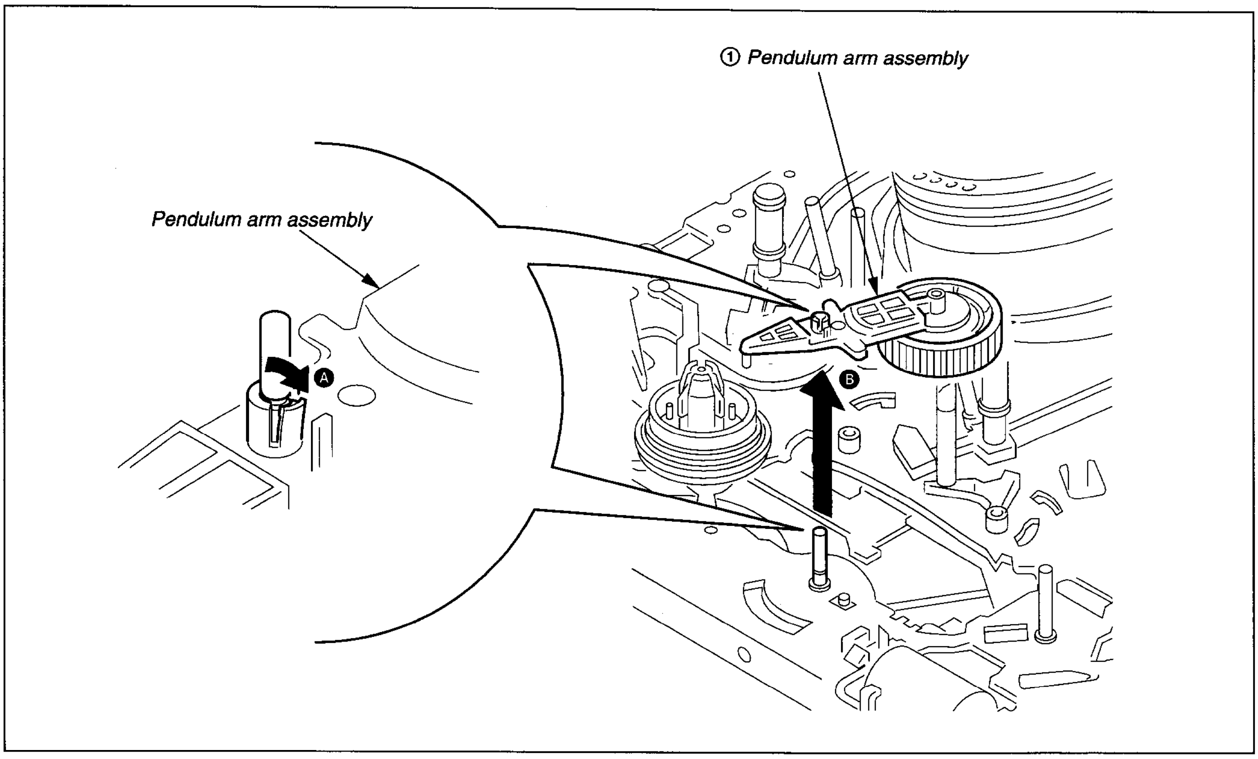

① Pendulum arm assembly
Pendulum arm assembly
A
B

Fig. 3-14

3-12. FL SLIDER BLOCK ASSEMBLY

1) Remove FL complete assembly. (Refer to 3-1.)
2) Set the mechanism deck upside down.
3) Remove a screw (BVTP 3 × 8) ① and then retainer plate ② is getting out of place.
4) Slide FL slider block assembly ③ off in the arrow Ⓐ direction and raise it up.

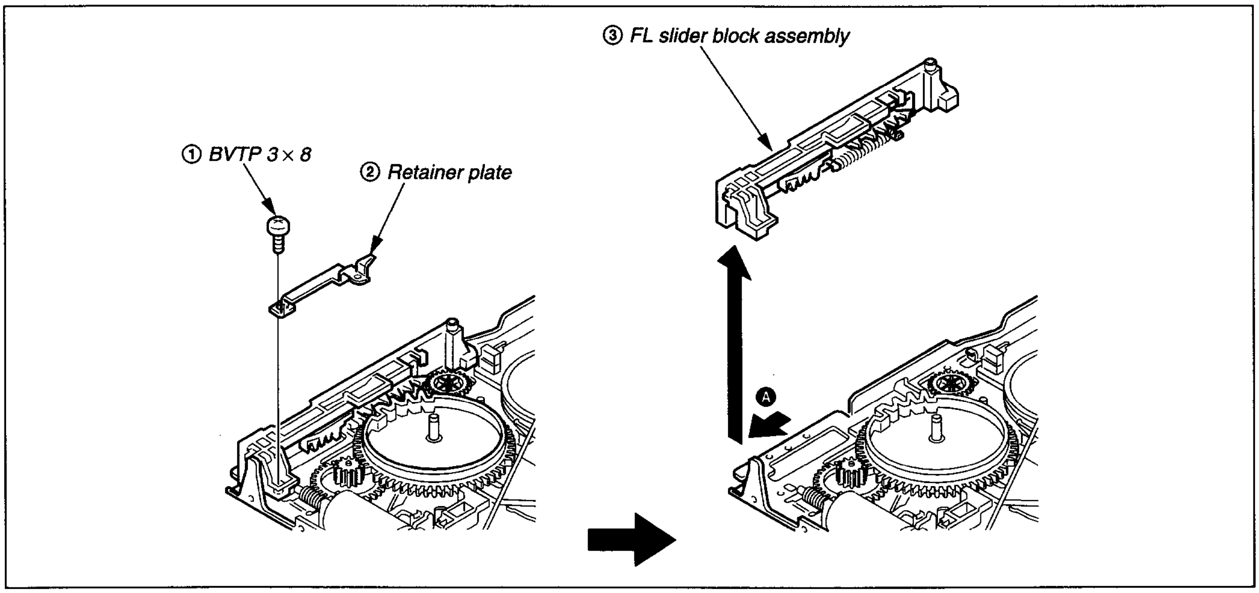
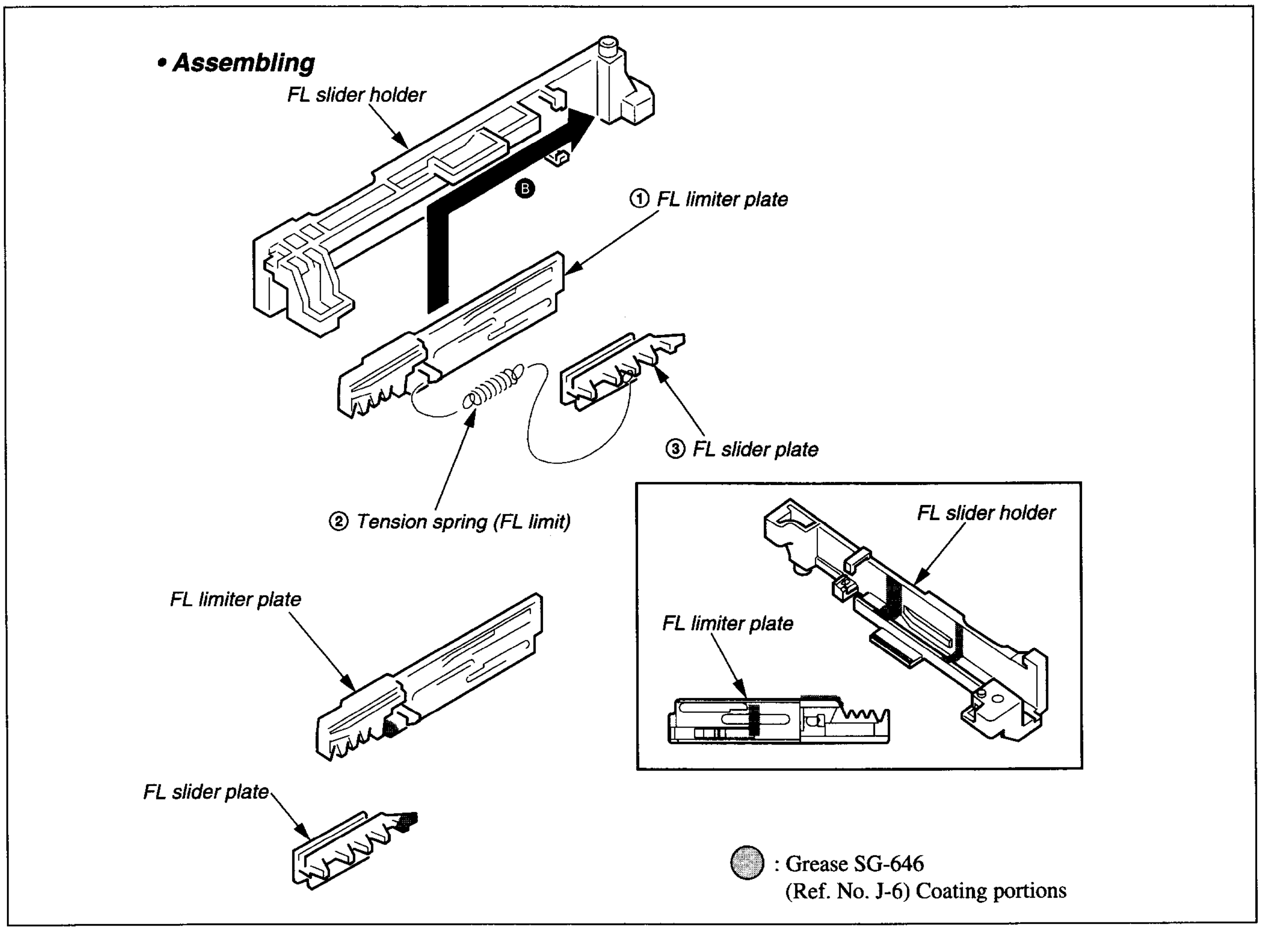

③ FL slider block assembly
① BVTP 3 × 8
② Retainer plate
Ⓐ

Fig. 3-15


• Assembling
FL slider holder
Ⓑ
① FL limiter plate
③ FL slider plate
② Tension spring (FL limit)
FL slider holder
FL limiter plate
FL limiter plate
FL slider plate

● : Grease SG-646
(Ref. No. J-6) Coating portions

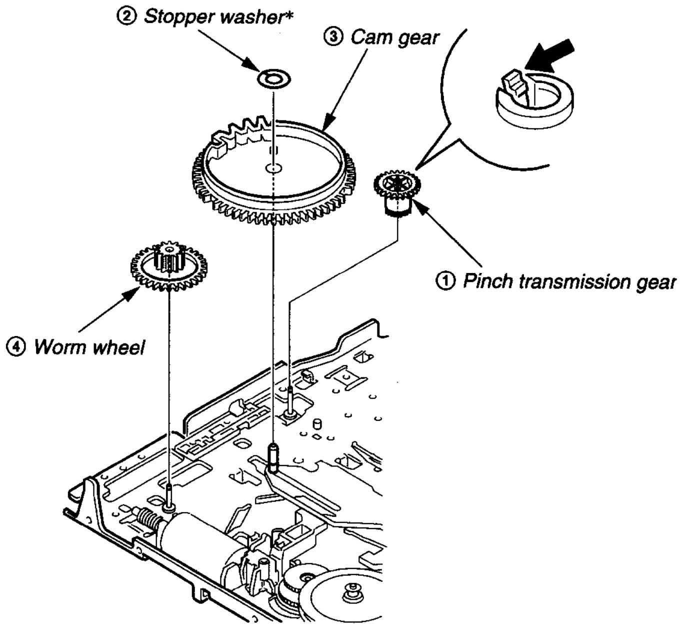
Fig. 3-16

3-13. PINCH TRANSMISSION GEAR, CAM GEAR, WORM WHEEL

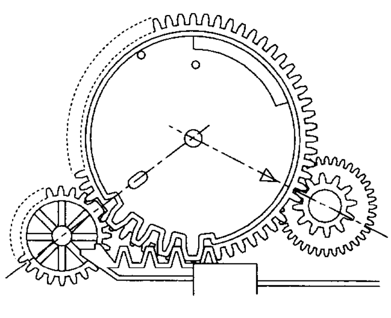
1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove pinch transmission gear ① by putting off its claw from shaft.
4) Remove stopper washer ②* to pull out cam gear ③.
5) Remove worm wheel ③ by putting off its claw from shaft.

[Note on Mounting]

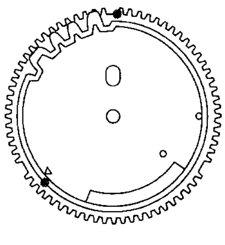
- Before attaching cam gear ③, confirm that the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Adjust the phase of gears each other.



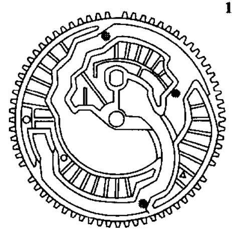
• Phase adjustment



[Top]



[Bottom]



● : Grease SG-646
(Ref. No. J-6) Coating portions

* Once remove stopper washer ②, don't use it again. Replace it with new one.

Fig. 3-17

3-14. CAPSTAN BRAKE ASSEMBLY, CAPSTAN BRAKE SHAFT

1) Remove rubber belt. (Refer to 3-4.)
2) Remove cap brake spring ①.
3) Remove capstan brake assembly ② by putting off claw of capstan brake shaft ③.
4) Set the mechanical chassis bottom side down.
5) While pushing the boss of capstan brake shaft ③, turn it clockwise to remove it.

[Note on Mounting]
- Don't touch shoe of capstan brake assembly with bare hand.

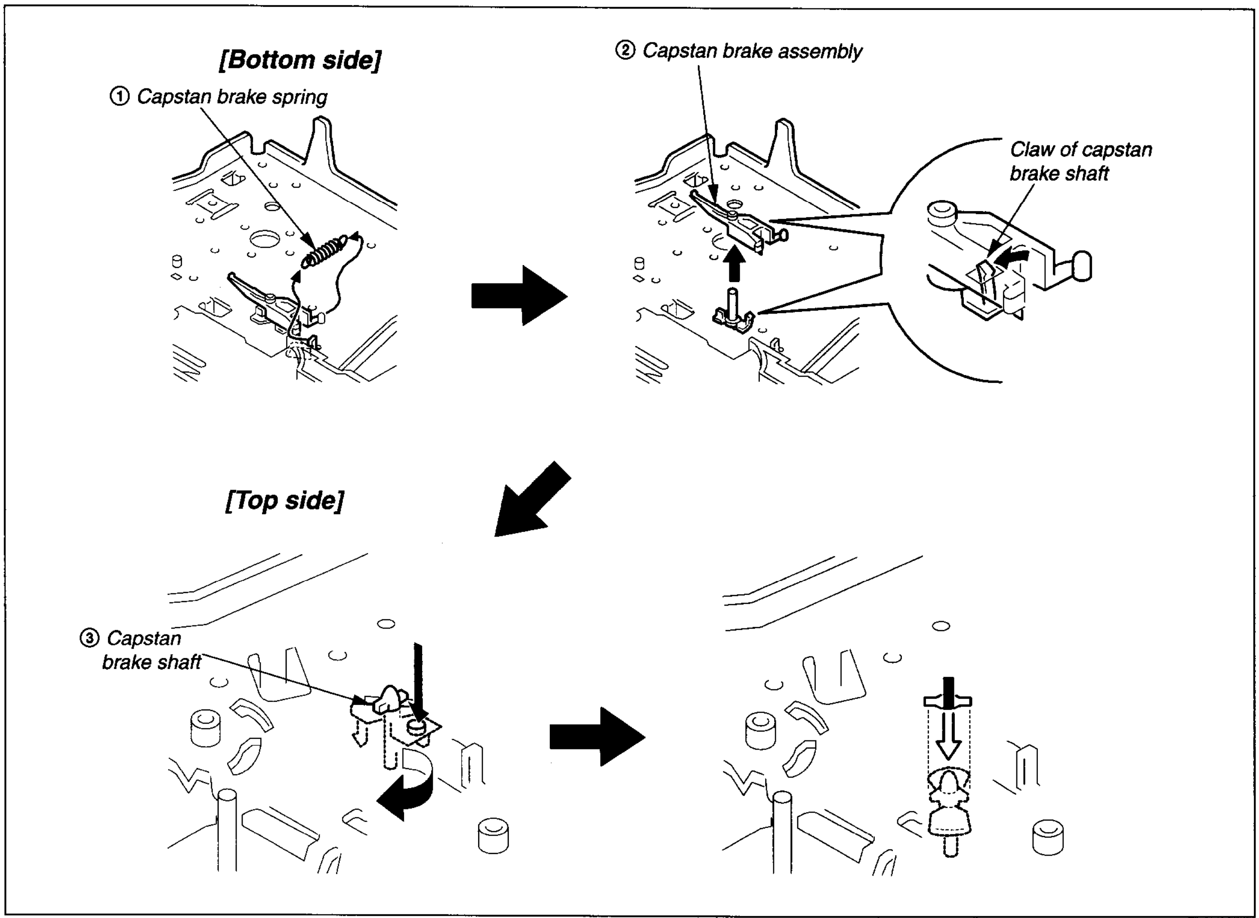

[Bottom side]
① Capstan brake spring
② Capstan brake assembly
Claw of capstan brake shaft
[Top side]
③ Capstan brake shaft

Fig. 3-18

3-15. FL SLIDER GUIDE

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove FL slider block assembly. (Refer to 3-12.)
3) Remove FL slider guide ① while pushing claws in the arrow Ⓐ direction.

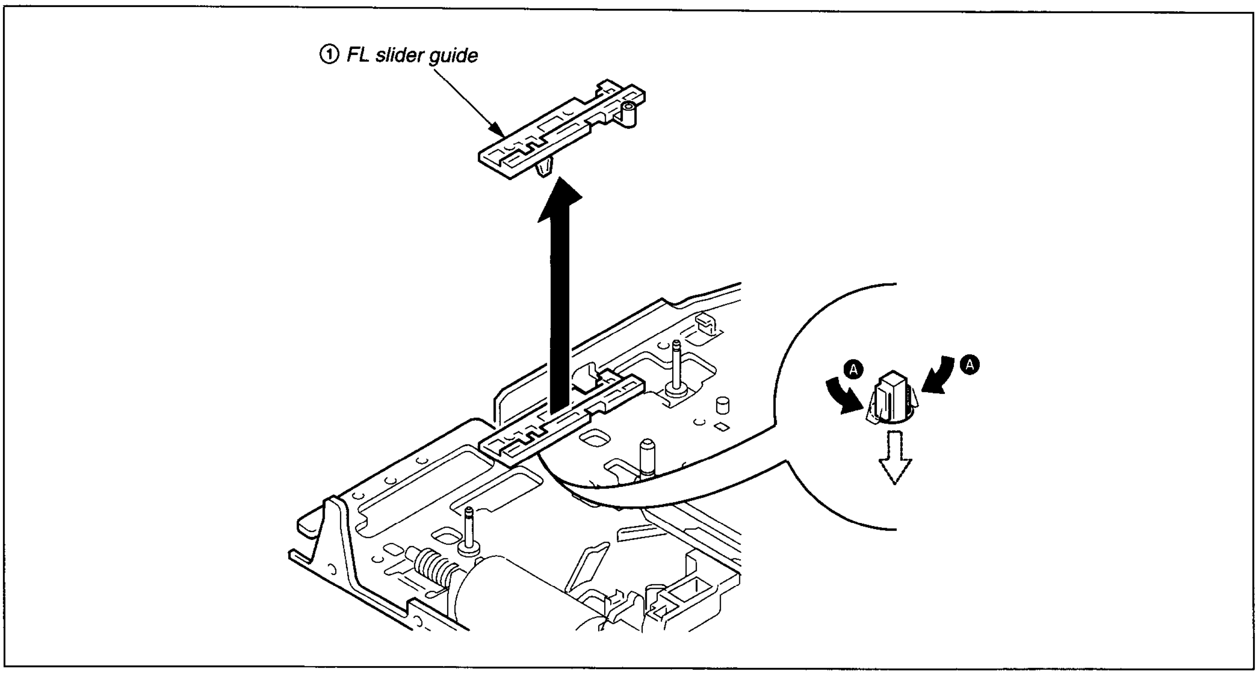


Fig. 3-19

3-16. SLIDER

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove stopper washers ① and remove slider ② in the arrow direction.

[Note on Mounting]

- Before attaching slider ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- When attaching slider ②, adjust "Δ" mark on slider to loading gear (T) shaft as shown in Fig. A.

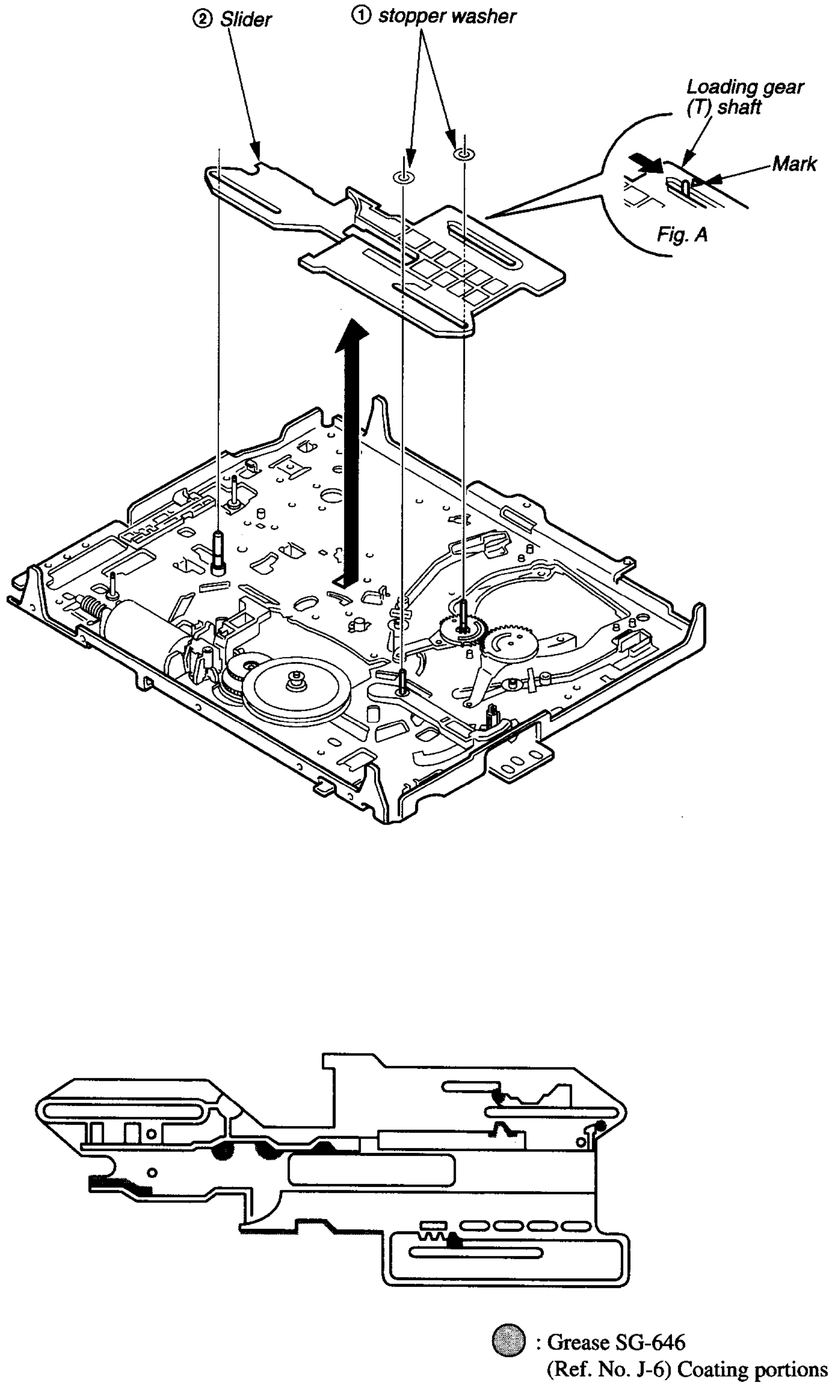

② Slider
① stopper washer
Loading gear (T) shaft
Mark
Fig. A
● : Grease SG-646
(Ref. No. J-6) Coating portions

Fig. 3-20

3-17. TG1 DRIVING ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove spring (power tension) ① from TG1 driving arm ②.
7) Remove TG1 driving arm ② by turning it in the arrow 🅐 to 🅑 direction.

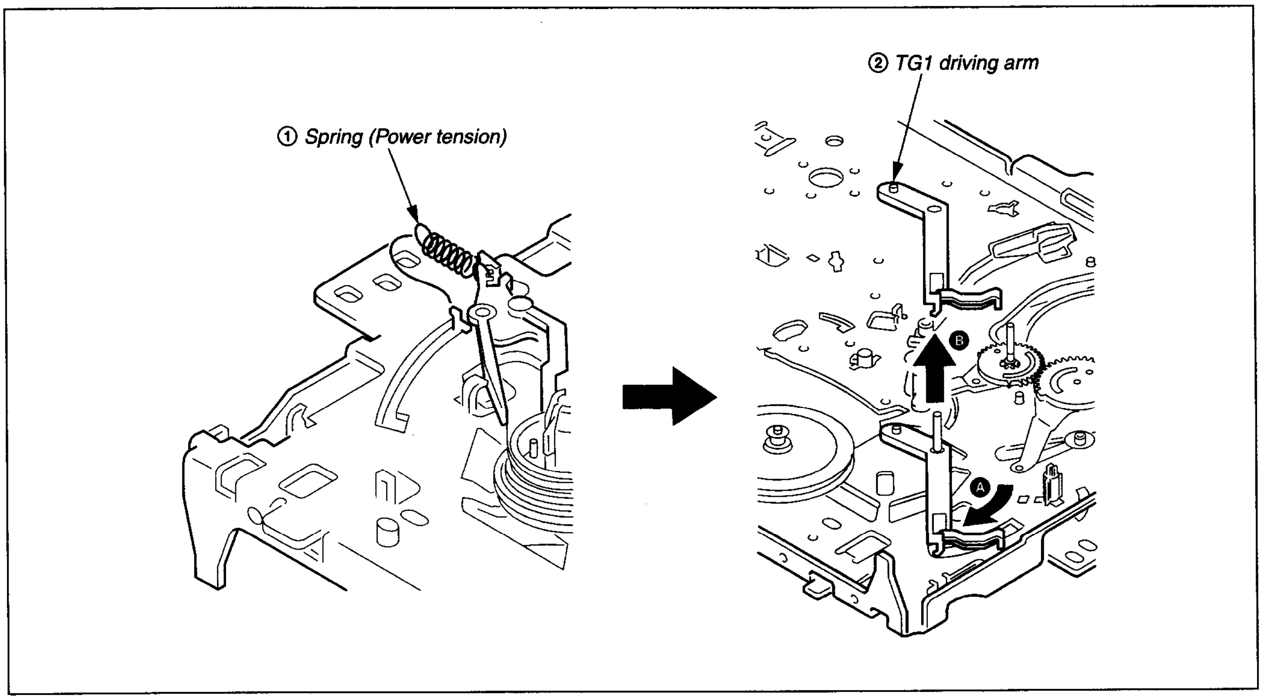

① Spring (Power tension)
② TG1 driving arm
B
A

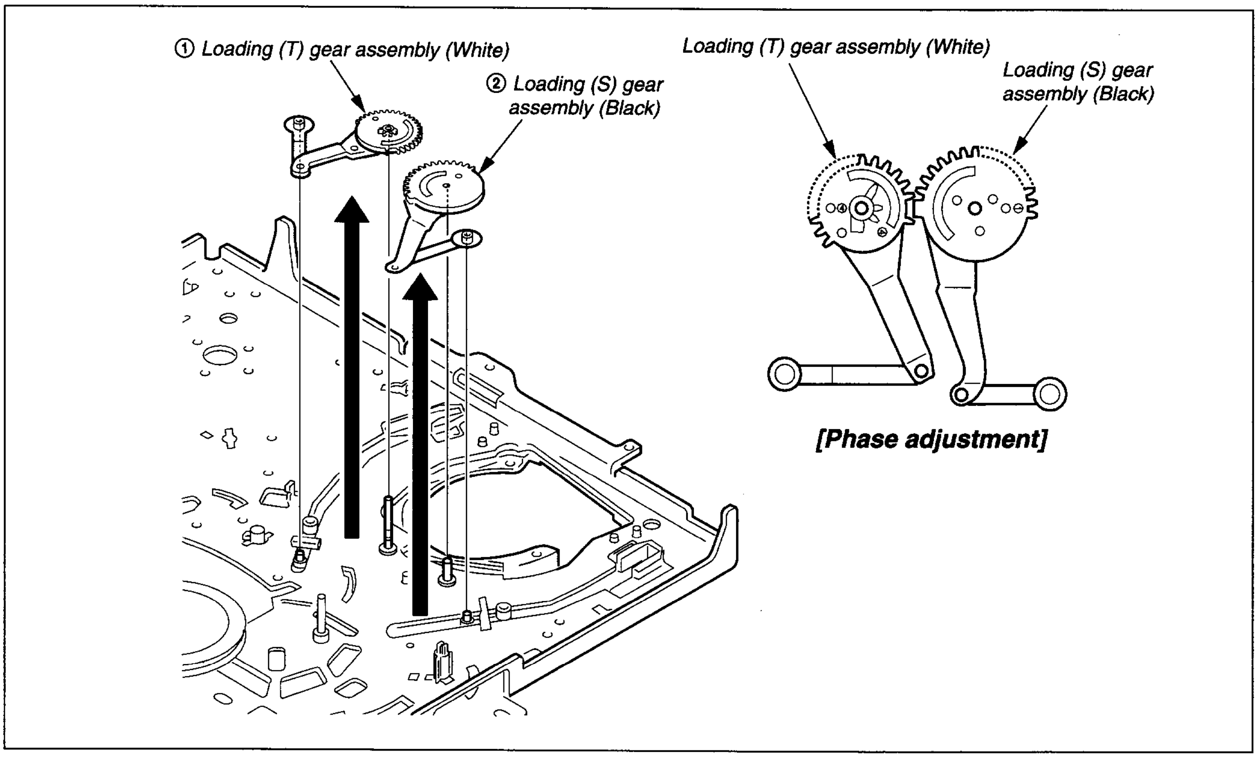
Fig. 3-21

3-18. LOADING (T) AND LOADING (S) GEAR ASSEMBLIES

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove cam gear. (Refer to 3-13.)
5) Remove slider. (Refer to 3-16.)
6) Remove loading (T) gear assembly ① and loading (S) gear assembly ② in the arrow direction.

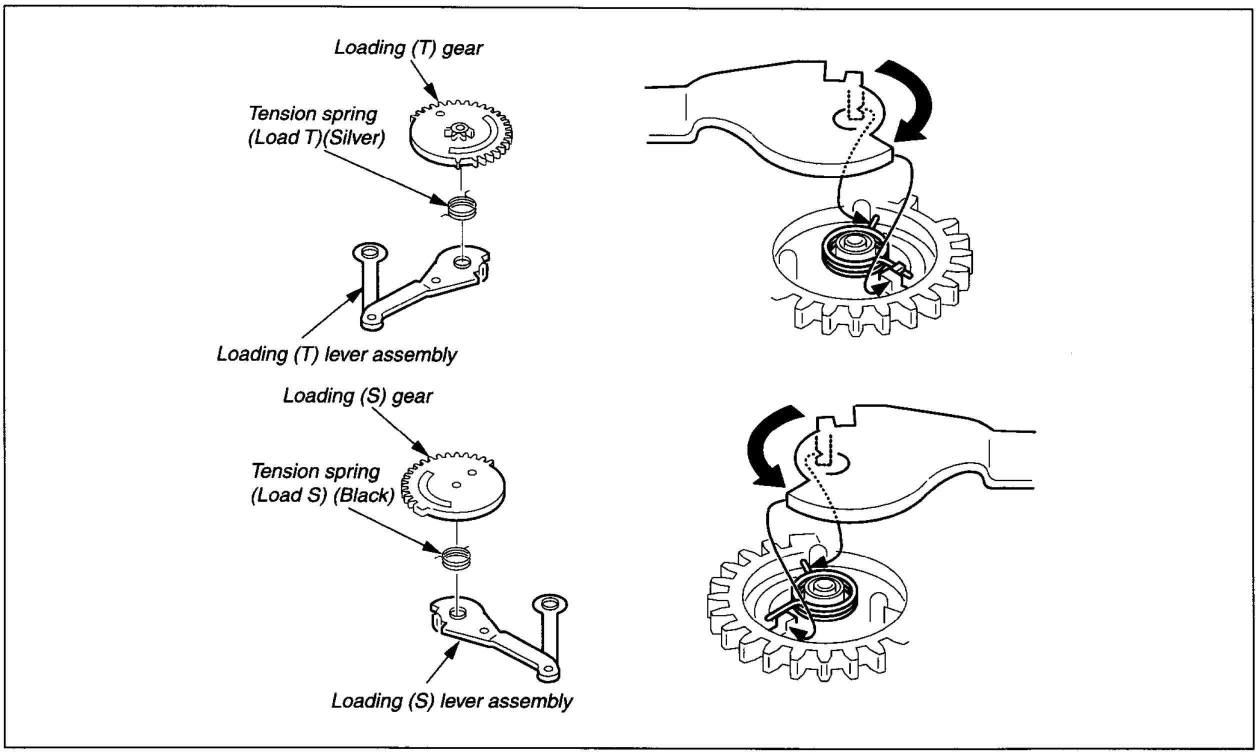
[Note on Mounting]

- When attaching them, be sure to adjust the phase each other.



① Loading (T) gear assembly (White)
② Loading (S) gear assembly (Black)
Loading (T) gear assembly (White)
Loading (S) gear assembly (Black)
[Phase adjustment]

Fig. 3-22



Loading (T) gear
Tension spring (Load T)(Silver)
Loading (T) lever assembly
Loading (S) gear
Tension spring (Load S) (Black)
Loading (S) lever assembly

Fig. 3-23

3-19. PULLEY GEAR ASSEMBLY, CLUTCH GEAR

1) Remove rubber belt. (Refer to 3-4.)
2) Remove stopper washer ①.
3) Remove pulley gear assembly ② with clutch gear ③.

[Note on Mounting]

- When attaching them, don't insert strongly.

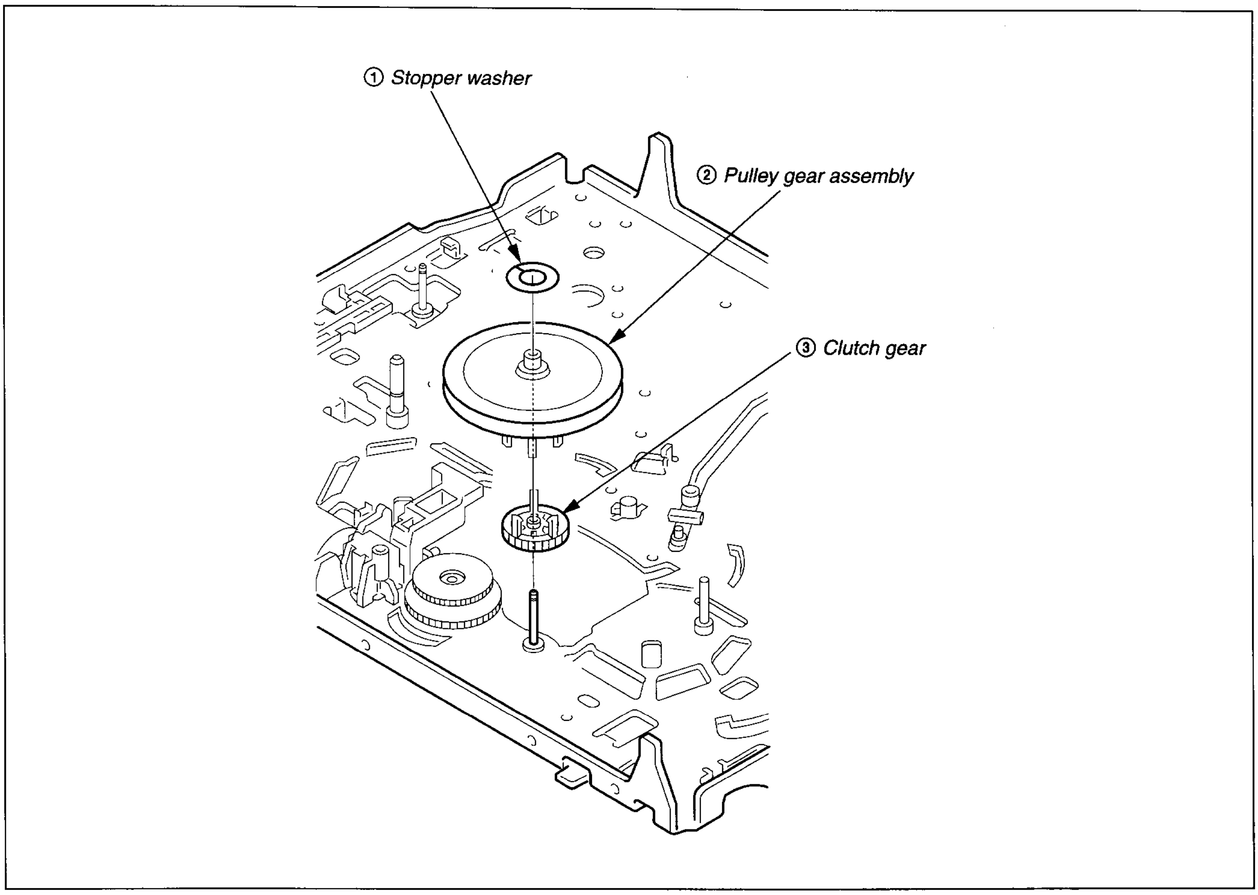

① Stopper washer
② Pulley gear assembly
③ Clutch gear

Fig. 3-24

3-20. REEL DIRECT ASSEMBLY

1) Remove rubber belt. (Refer to 3-5.)
2) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
3) Remove stopper washer ① and reel direct assembly ②.

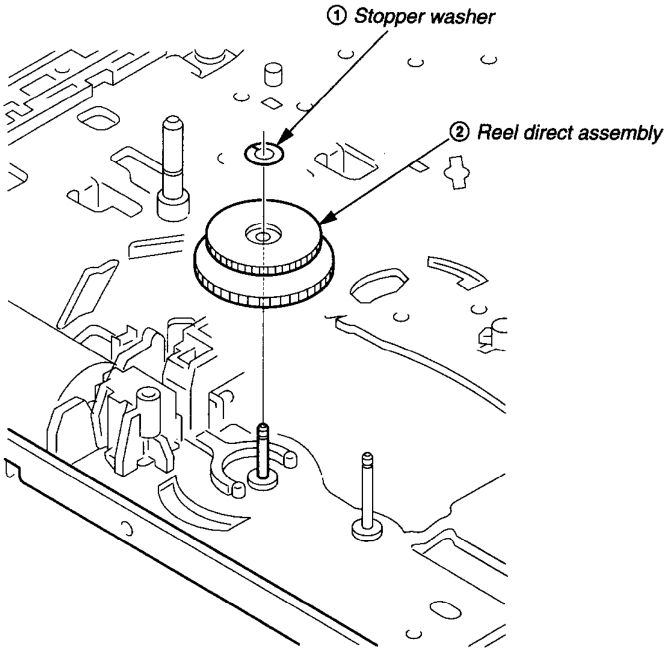

① Stopper washer
② Reel direct assembly

Fig. 3-25

3-21. CASSETTE GUIDE PLATE

1) Remove a screw (P 3 × 8) ① and remove cassette guide plate ②.

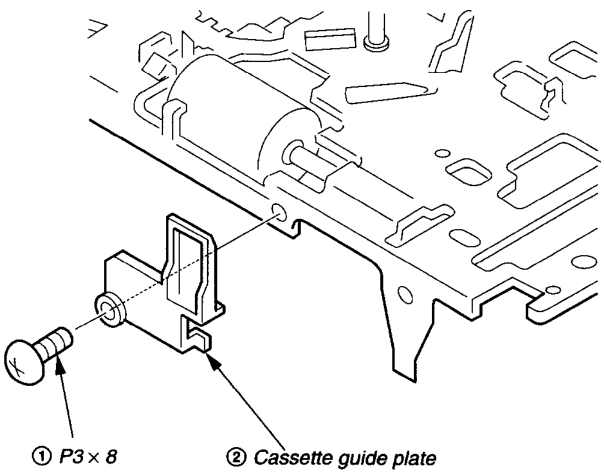

① P3 × 8
② Cassette guide plate

Fig. 3-26

3-23. DRUM BASE, HC ROLLER BLOCK ASSEMBLY

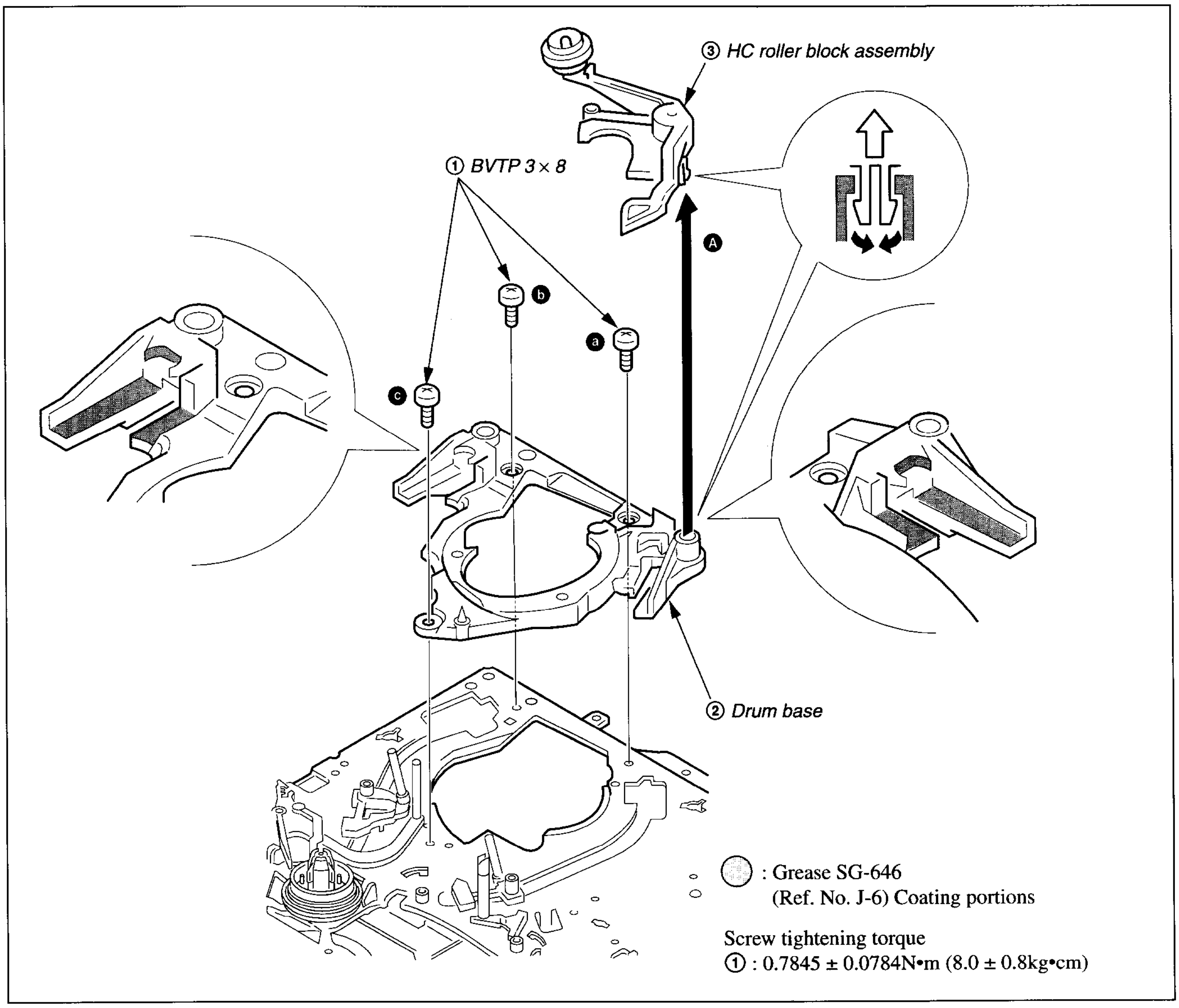
1) Remove the drum assembly. (Refer to 3-2.)
2) Remove screws BVTP 3 × 8 ①.
3) Remove drum base ②.
4) Pull out HC roller assembly ③ straight in the arrow 🅐 direction.

[Note on Mounting]

- Before attaching drum base ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).
- Tightening screws ① in the order ⓐ to ⓑ to ⓒ.

[Adjustment after Mounting]

- 4-1. Tape path adjustment



○ : Grease SG-646
(Ref. No. J-6) Coating portions

Screw tightening torque
① : 0.7845 ± 0.0784N•m (8.0 ± 0.8kg•cm)

Fig. 3-28

3-24. SHUTTLE (S) AND SHUTTLE (T) BLOCK ASSEMBLIES

1. Guide Roller Assemblies

1) Turn them counterclockwise, then they are out of place, also springs.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

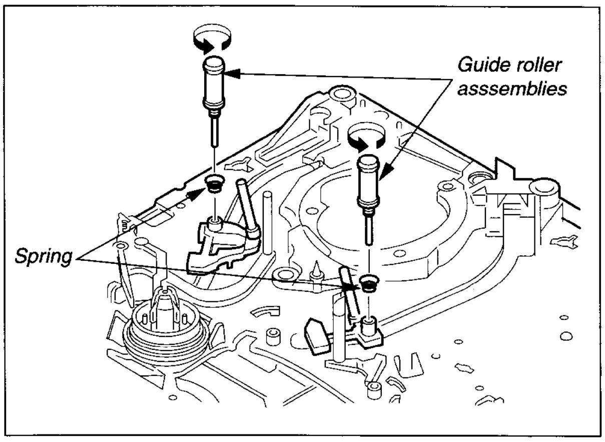

Guide roller asssemblies
Spring

Fig. 3-29

2. Shuttle (S) and Shuttle (T) Assemblies

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove the drum assembly. (Refer to 3-2.)
3) Remove rubber belt. (Refer to 3-4.)
4) Remove FL slider block assembly. (Refer to 3-12.)
5) Remove cam gear. (Refer to 3-13.)
6) Remove slider. (Refer to 3-16.)
7) Remove loading (T) gear assembly and loading (S) gear assembly. (Refer to 3-18.)
8) Remove drum base. (Refer to 3-23.)
9) Remove shuttle (S) or shuttle (T) assembly by slide them backward.

[Note on Mounting]

Don't touch the surface that contacts tape with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment

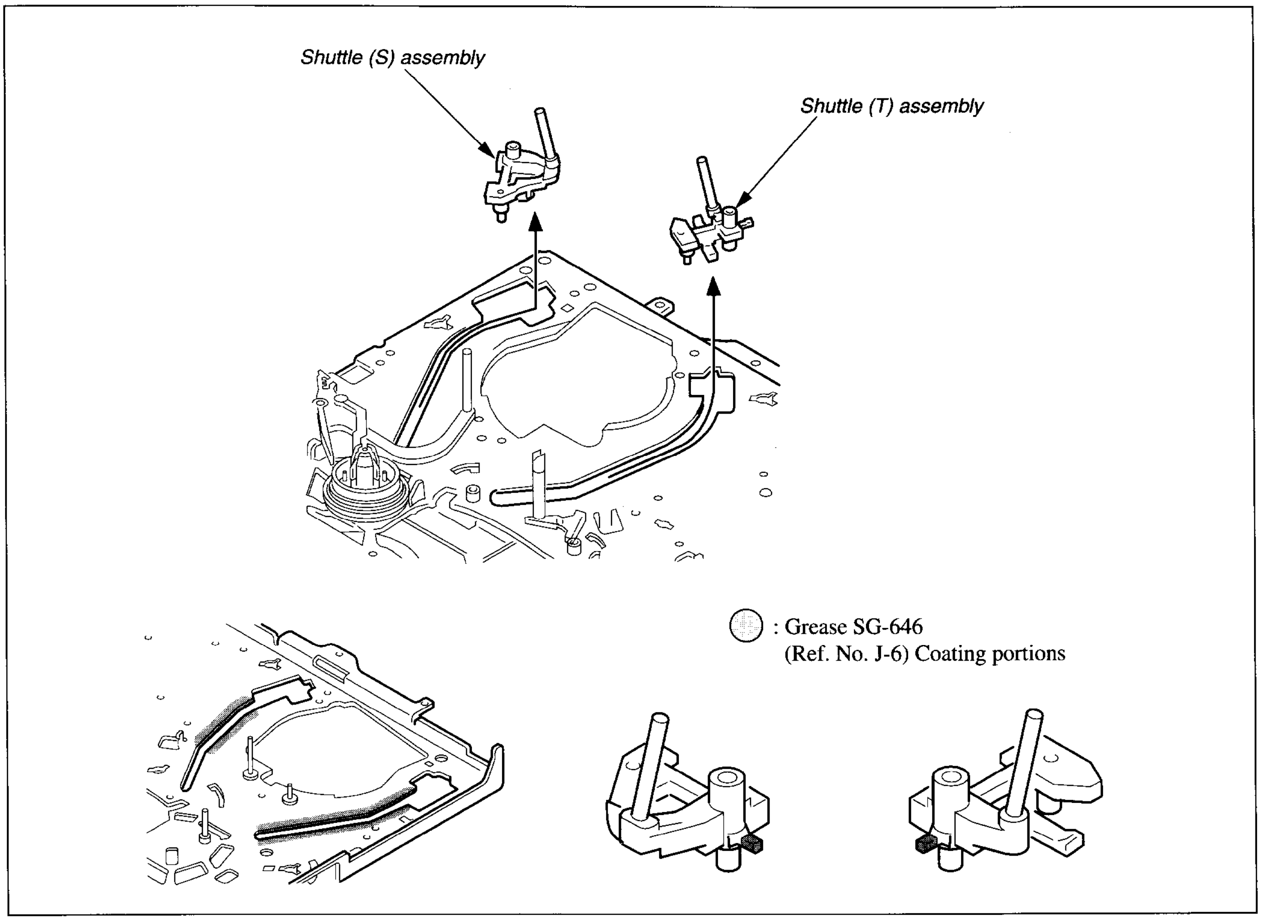

Shuttle (S) assembly
Shuttle (T) assembly
: Grease SG-646
(Ref. No. J-6) Coating portions

Fig. 3-30

3-25. TG1 ASSEMBLY, REEL (S) TABLE

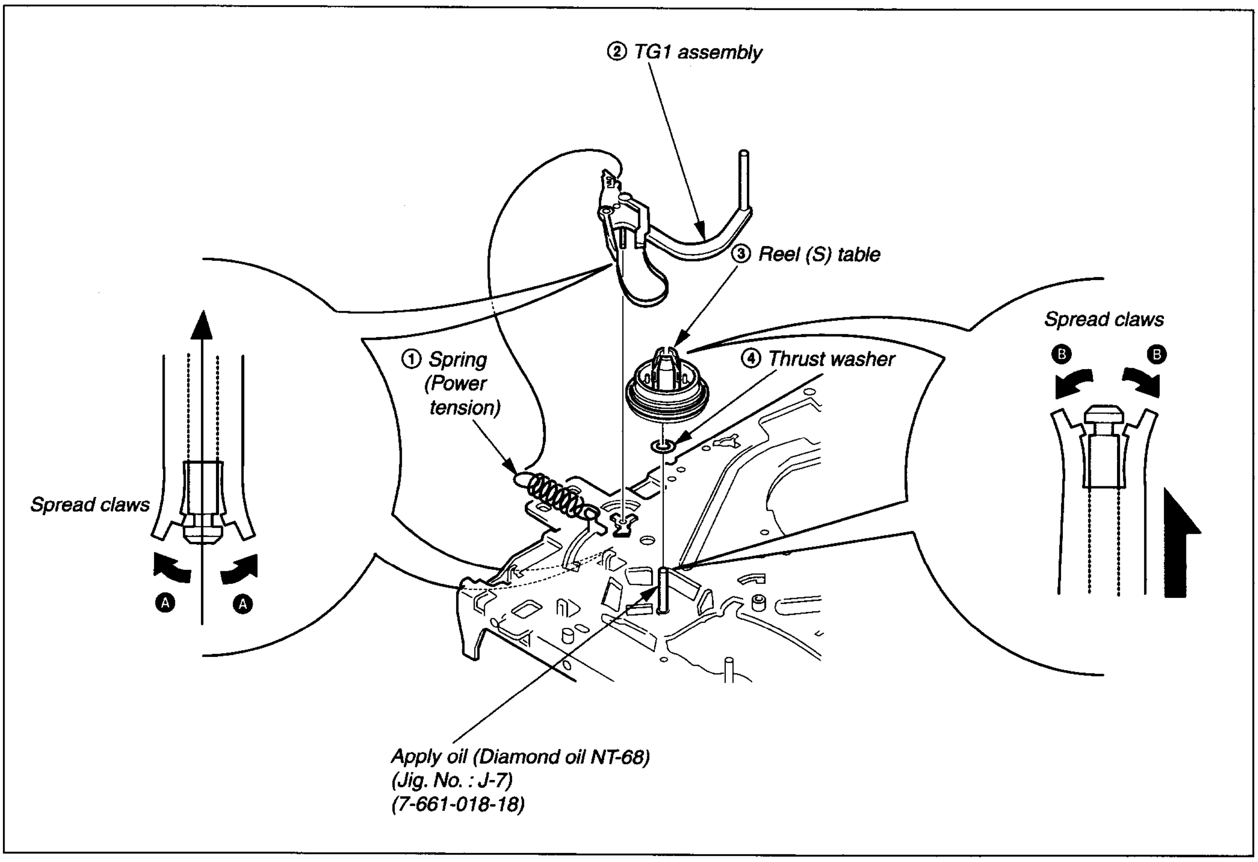
1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove spring (power tension) ① from TG1 driving arm.
3) While spreading claws on the bottom in the arrows Ⓐ direction, pull TG1 assembly ② out.
4) While spreading claws on the top in the arrows Ⓑ direction, pull reel (S) table ③ out.
5) Remove thrust washer ④.

[Note on Mounting]

Don't touch the surface that contacts tape and the braking surface of TG1 assembly with bare hand.

[Adjustment after Mounting]

- 4-1. Tape path adjustment



② TG1 assembly
③ Reel (S) table
① Spring (Power tension)
④ Thrust washer
Spread claws
Ⓑ Ⓑ
Spread claws
Ⓐ Ⓐ
Apply oil (Diamond oil NT-68) (Jig. No. : J-7) (7-661-018-18)

Fig. 3-31

3-26. TG1 FULCRUM BOSS

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove TG1 assembly. (Refer to 3-25.)
3) Turn TG1 fulcrum boss counterclockwise and pull it out.

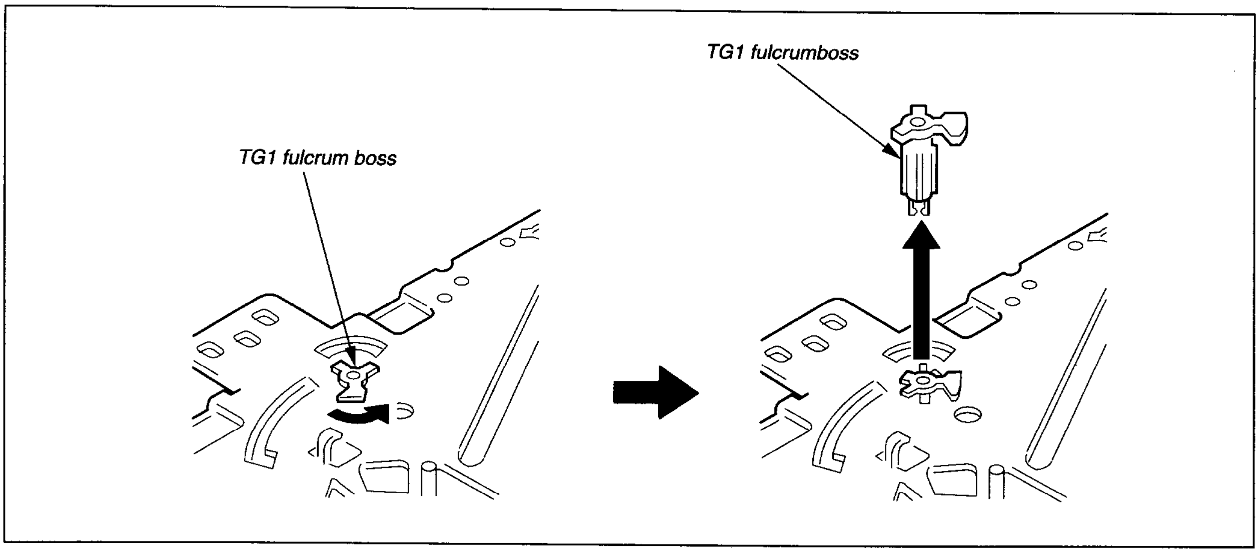

TG1 fulcrumboss
TG1 fulcrum boss

Fig. 3-32

3-27. LUMINOUS PLATE

1) Remove main (T) brake assembly. (Refer to 3-9.)
2) Turn luminous plate clockwise while raising a portion Ⓐ slightly and pull out it.

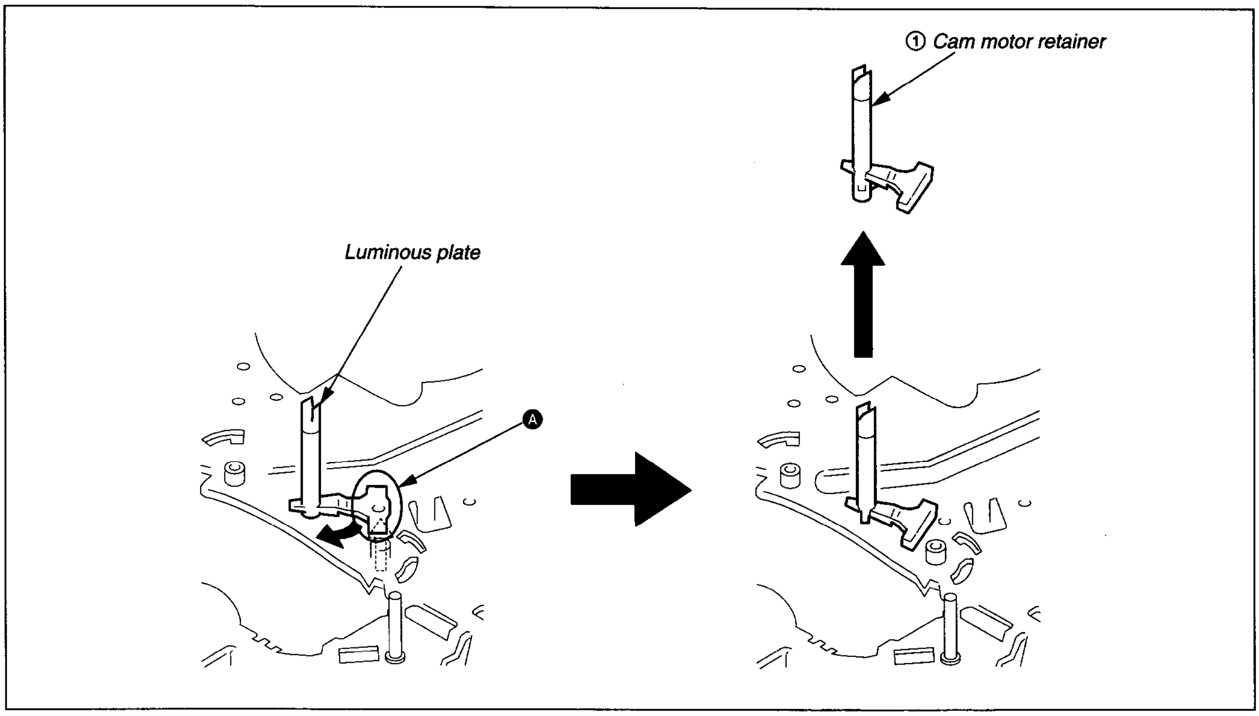

① Cam motor retainer
Luminous plate
Ⓐ

Fig. 3-33

4. ADJUSTMENT

4-1. TAPE PATH ADJUSTMENT

The "Tape path" refers to the route of the tape from the supply reel disk to the take-up reel disc via the video heads.

Each component part of the tape transport system particularly the surface of parts which make direct contact with the tape must always be kept clean, free of dust, oil, scratches and so forth.

The tape path system is factory pre-adjusted, when parts of the tape transport system are replaced, be sure to make the required adjustments as precisely as possible in order to ensure stable tape transport.

4-1-1. TENSION REGULATOR (TG1) POSITION/ TENSION ADJUSTMENT (Fig. 4-1)

Purpose: stabilizes contact of the video head and the tape to maintain the tension of the tape so that it feeds at a constant level.

• Position adjustment

Mode	Threading is completed without a cassette loaded (Playback)
Adjustment locations	Eccentric pin of TG1 band assembly

[Adjustment Method]

1) Allow the unit to go through the threading procedure without a cassette loaded.
2) Set the unit to play back, then turn the eccentric pin so that the tip of tension arm goes to the left side line carved on the mechanical chassis. (Fig. A)
3) After adjustment, go through the loading procedure once more without a cassette loaded, then check the position of the tension arm.

• Tension adjustment

Mode	Playback (SP)
Measuring instrument/tool	Torque cassette VHT-103S (Ref. No. J-1)
Adjustment locations	Position for hooking the tension spring
Specified value	5.05 to 6.52 mN•m (51.5 to 66.5g•cm) (without TC assembly) 3.78 to 5.10 mN•m (38.5 to 52.0g•cm) (with TC assembly)

[Adjustment Method]

1) Playback the torque cassette.
2) Check that the center value deviation reading on the torque cassette meets with the standards.
3) When the reading is higher than the standards : Move the spring toward direction Ⓐ.
When the reading is less than the standards : Move the spring toward direction Ⓑ.

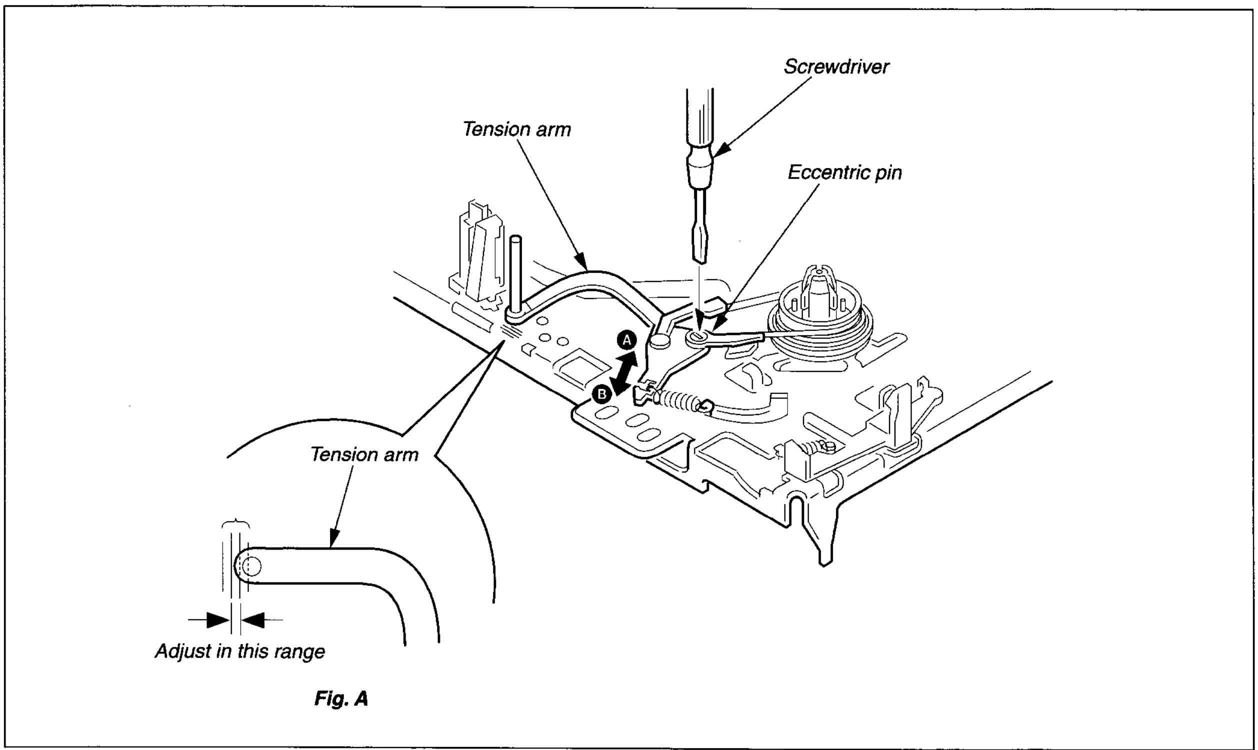


Fig. 4-1

4-1-2. CHECKING THE TENSION AND TORQUE

Purpose : To check that the tension, torque and compression force of the tape take-up section and mobile sections to ensure smooth tape run and achieve standard VTR performance.
If the tape transport is not smooth or problems occur in relation to the tape transport speed, perform the following check.

Mode	Each operation mode
Measuring instrument	Torque cassette VHT-103S, VHT-404S

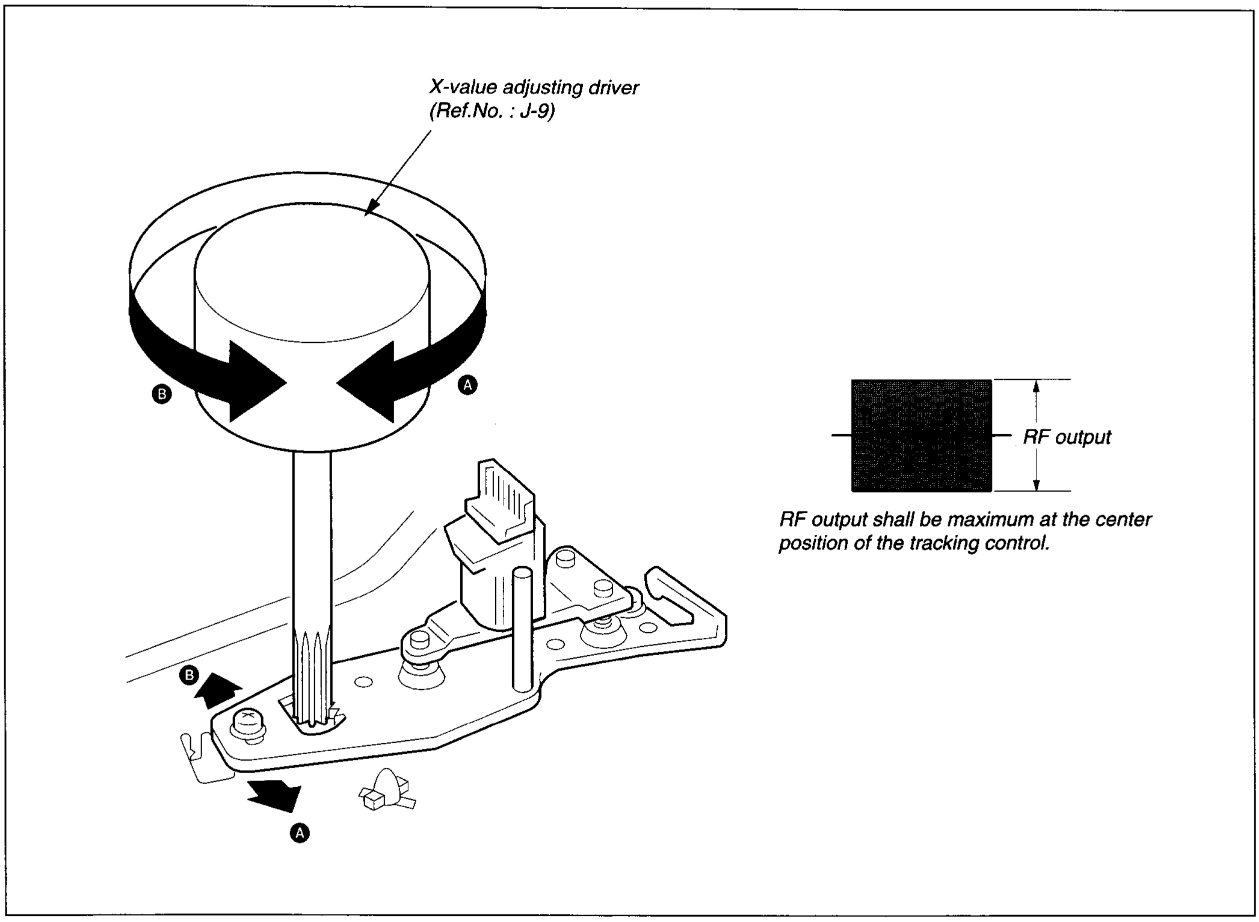
Item	VTR operation mode	Reel to be measured	Measurement value
Review torque	Review	S reel	12.7 to 19.6 mN•m (130 to 200 g•cm)
Take-up torque	Playback	T reel	4.41 to 10.8 mN•m (45 to 110g•cm)
Back tension torque	Playback	S reel	See section 4-1-1.

4-1-3. X-VALUE ADJUSTMENT (Using the tape having the version No.)

Purpose: To obtain compatibility with other VCRs.

Precaution: Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/ 52PL(PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly



RF output shall be maximum at the center position of the tracking control.

Fig. 4-2

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the ACE head position with X-value adjusting driver where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.

* TYPE OF DRUM

DZH-68D
DZH-71D
DZH-77A
DZH-78A
DZH-78B
DZH-89A
DZH-90A
DZH-91A
DZH-92A

1. Adjusting X-value (Using the tape having the version No.)

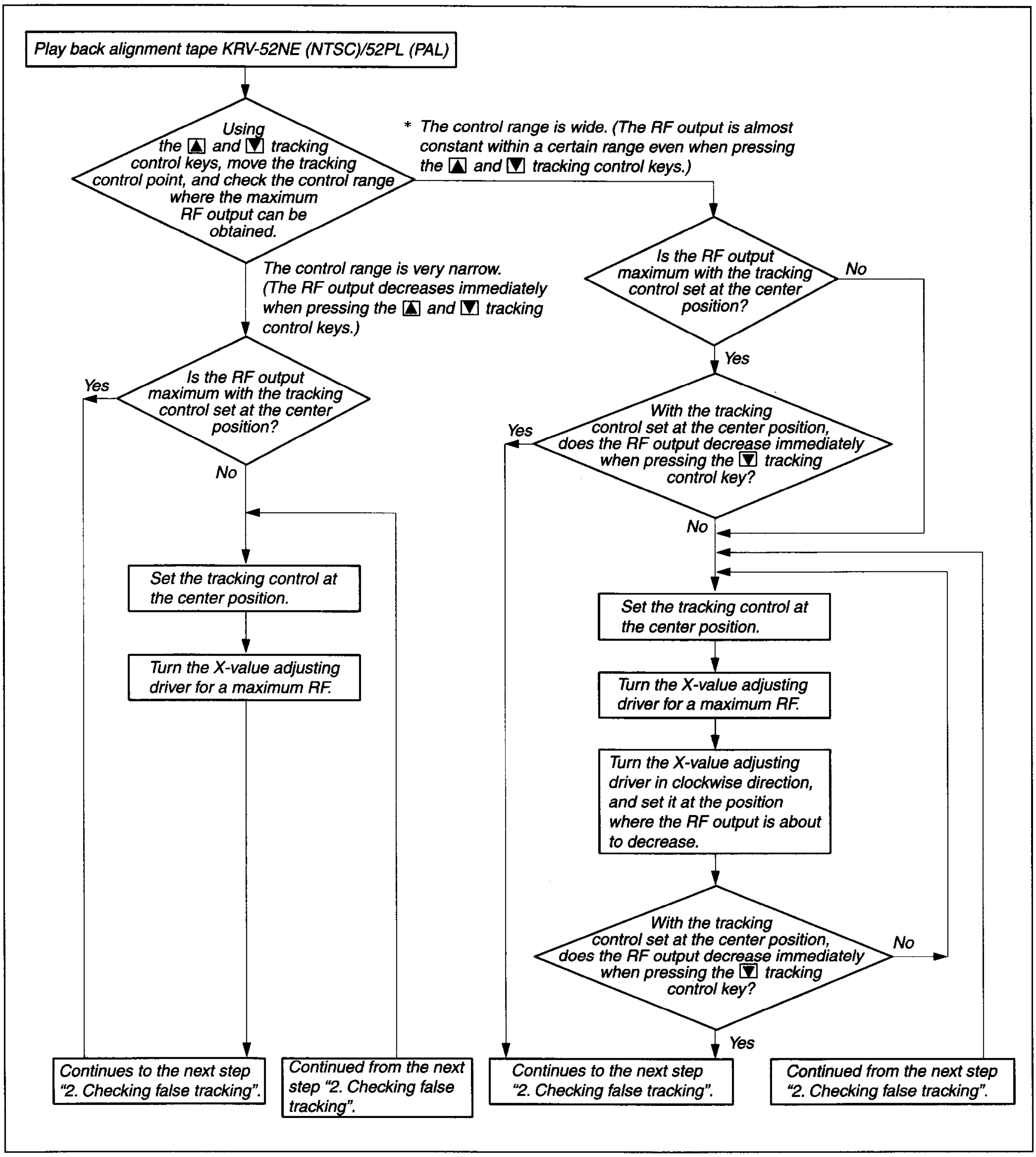
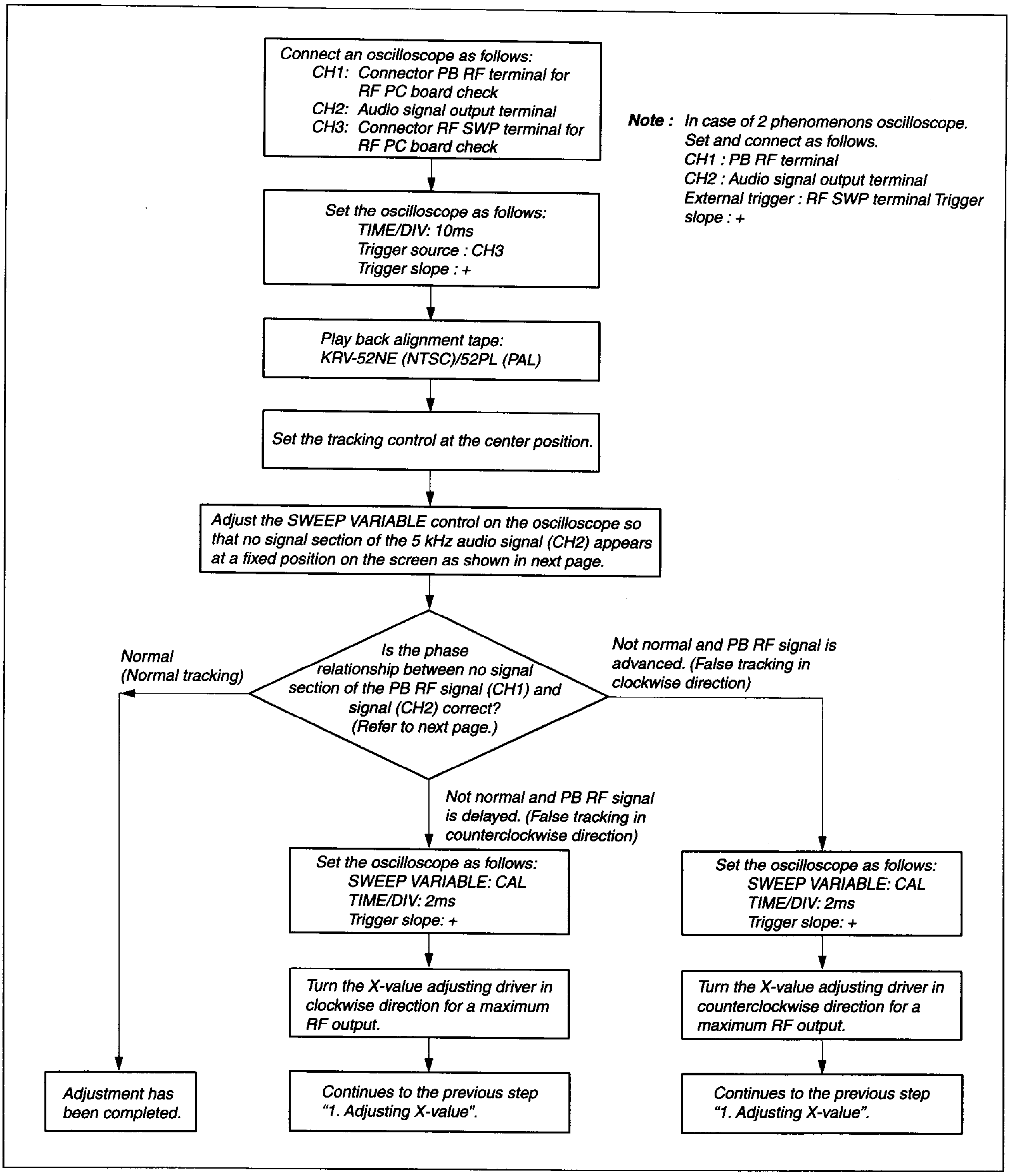

Play back alignment tape KRV-52NE (NTSC)/52PL (PAL)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
* The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Turn the X-value adjusting driver in clockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

Table. 4-1

2. Checking false tracking
(Using the tape having the version No.)


Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source : CH3
Trigger slope : +
Play back alignment tape:
KRV-52NE (NTSC)/52PL (PAL)
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and signal (CH2) correct? (Refer to next page.)
Normal (Normal tracking)
Not normal and PB RF signal is advanced. (False tracking in clockwise direction)
Not normal and PB RF signal is delayed. (False tracking in counterclockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjusting driver in clockwise direction for a maximum RF output.
Turn the X-value adjusting driver in counterclockwise direction for a maximum RF output.
Adjustment has been completed.
Continues to the previous step "1. Adjusting X-value".
Continues to the previous step "1. Adjusting X-value".

Note : *In case of 2 phenomenons oscilloscope.*
Set and connect as follows.
CH1 : PB RF terminal
CH2 : Audio signal output terminal
External trigger : RF SWP terminal Trigger slope : +

Table. 4-2

Using the tape having the version No.

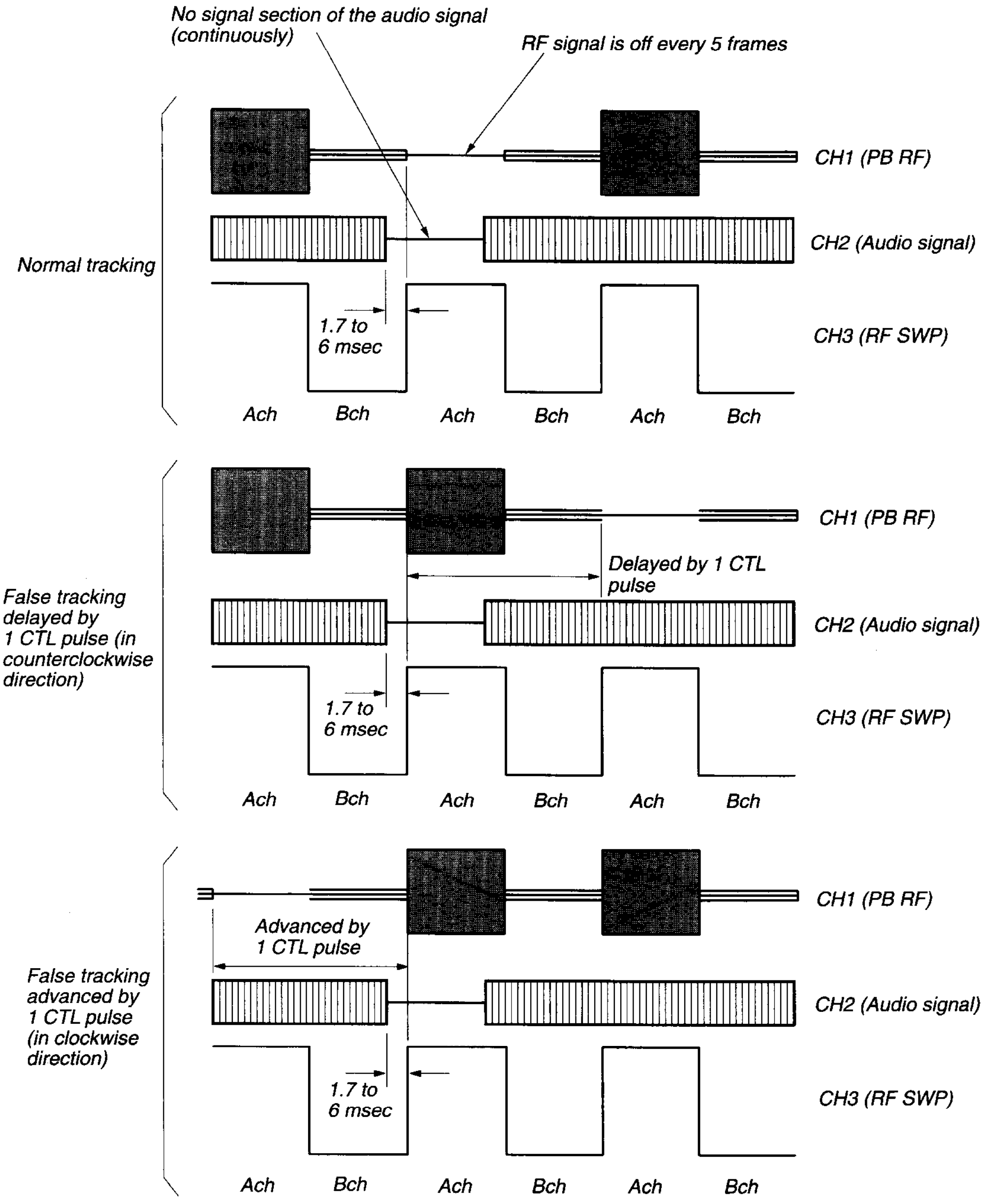

No signal section of the audio signal (continuously)
RF signal is off every 5 frames
Normal tracking
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in counterclockwise direction)
CH1 (PB RF)
Delayed by 1 CTL pulse
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in clockwise direction)
CH1 (PB RF)
Advanced by 1 CTL pulse
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

Table. 4-3

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

1. Adjusting X-value (Using the tape having the version No.)

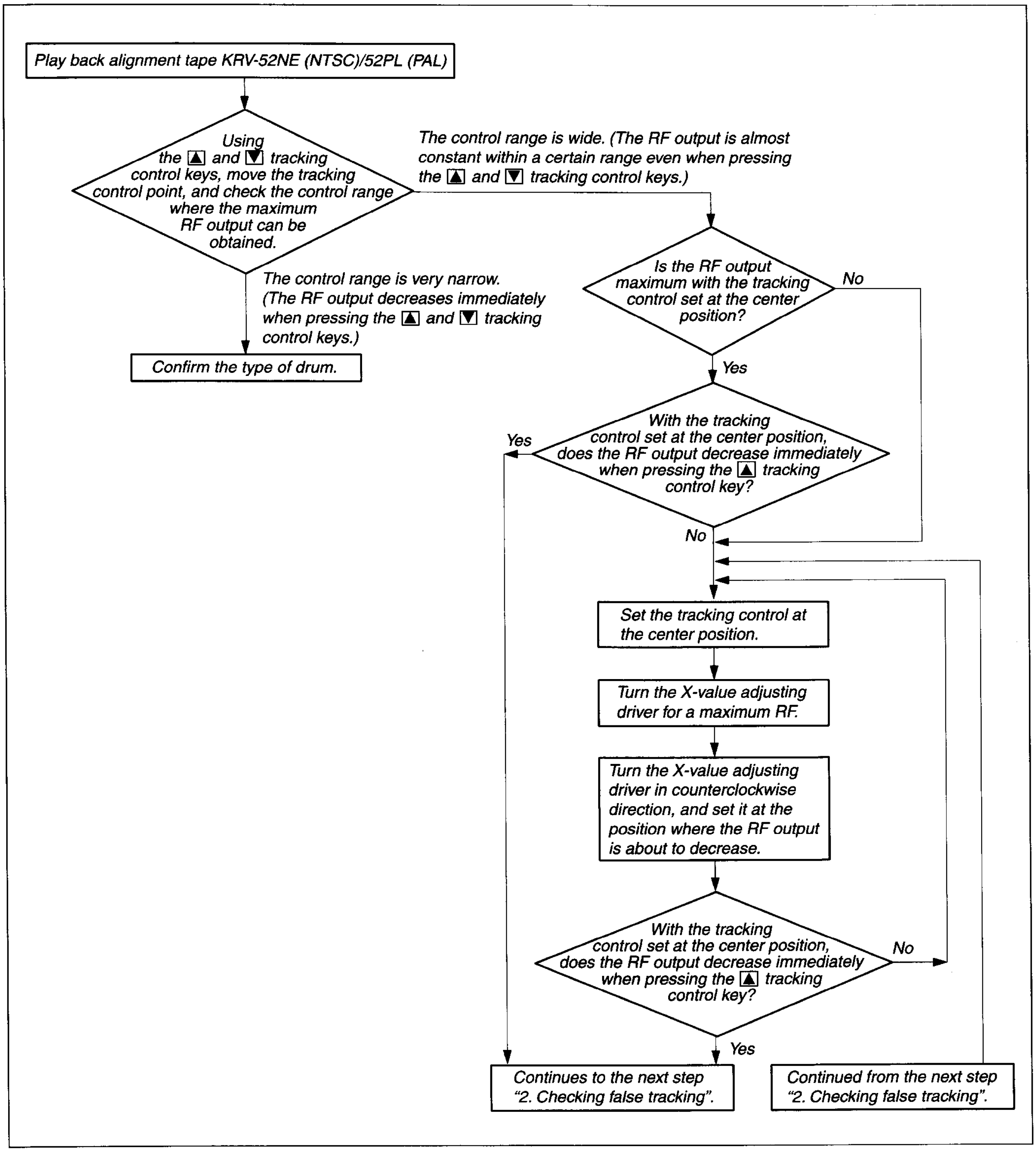
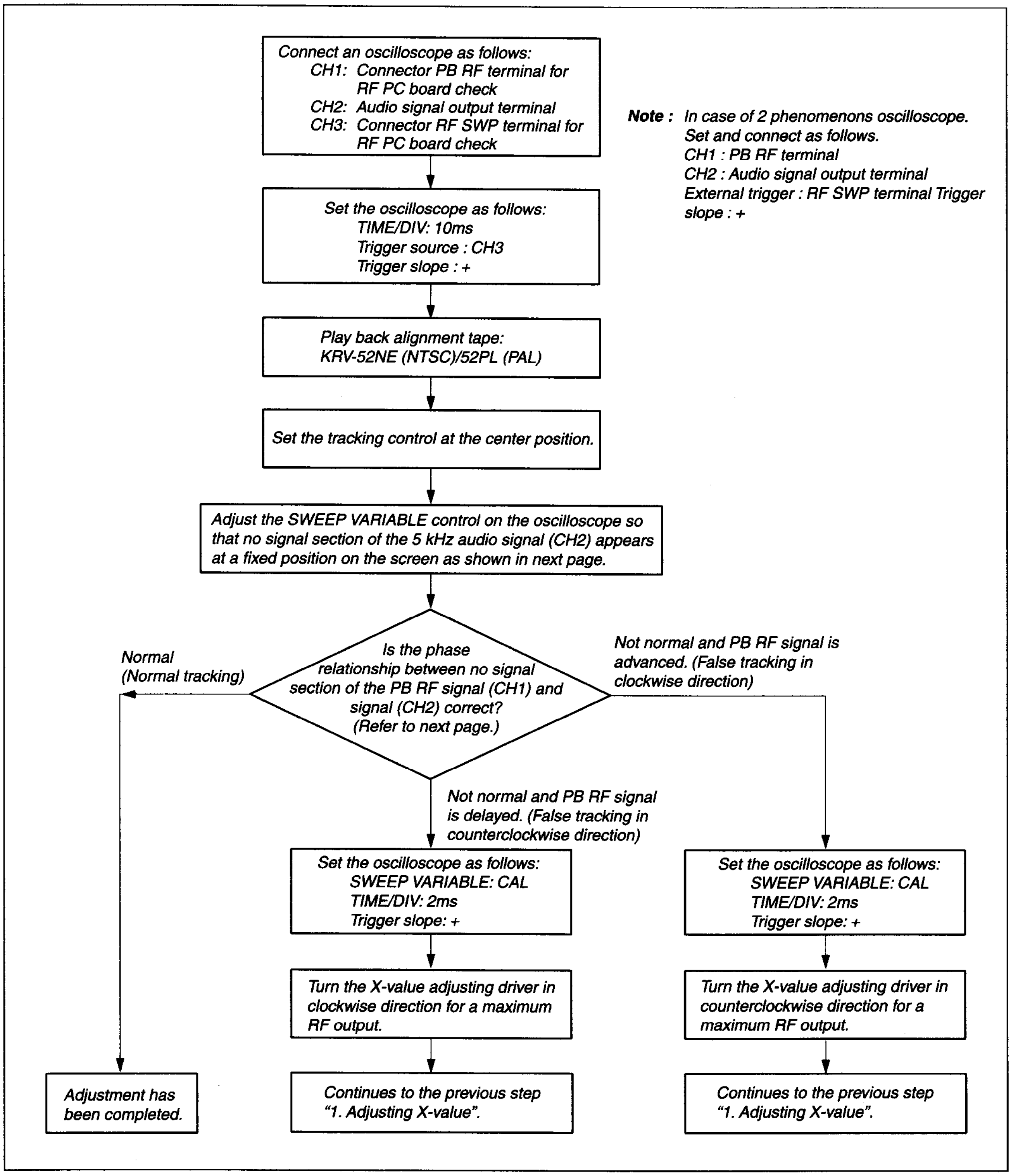

Play back alignment tape KRV-52NE (NTSC)/52PL (PAL)
Using the ▲ and ▼ tracking control keys, move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Confirm the type of drum.
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
Yes
No
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF.
Turn the X-value adjusting driver in counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
No
Yes
Continues to the next step "2. Checking false tracking".
Continued from the next step "2. Checking false tracking".

Table. 4-4

2. Checking false tracking
(Using the tape having the version No.)


Connect an oscilloscope as follows:
CH1: Connector PB RF terminal for RF PC board check
CH2: Audio signal output terminal
CH3: Connector RF SWP terminal for RF PC board check
Set the oscilloscope as follows:
TIME/DIV: 10ms
Trigger source : CH3
Trigger slope : +
Play back alignment tape:
KRV-52NE (NTSC)/52PL (PAL)
Set the tracking control at the center position.
Adjust the SWEEP VARIABLE control on the oscilloscope so that no signal section of the 5 kHz audio signal (CH2) appears at a fixed position on the screen as shown in next page.
Is the phase relationship between no signal section of the PB RF signal (CH1) and signal (CH2) correct? (Refer to next page.)
Normal (Normal tracking)
Not normal and PB RF signal is advanced. (False tracking in clockwise direction)
Not normal and PB RF signal is delayed. (False tracking in counterclockwise direction)
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Set the oscilloscope as follows:
SWEEP VARIABLE: CAL
TIME/DIV: 2ms
Trigger slope: +
Turn the X-value adjusting driver in clockwise direction for a maximum RF output.
Turn the X-value adjusting driver in counterclockwise direction for a maximum RF output.
Adjustment has been completed.
Continues to the previous step "1. Adjusting X-value".
Continues to the previous step "1. Adjusting X-value".

Note : *In case of 2 phenomenons oscilloscope.*
Set and connect as follows.
CH1 : PB RF terminal
CH2 : Audio signal output terminal
External trigger : RF SWP terminal Trigger slope : +

Table. 4-5

Using the tape having the version No.

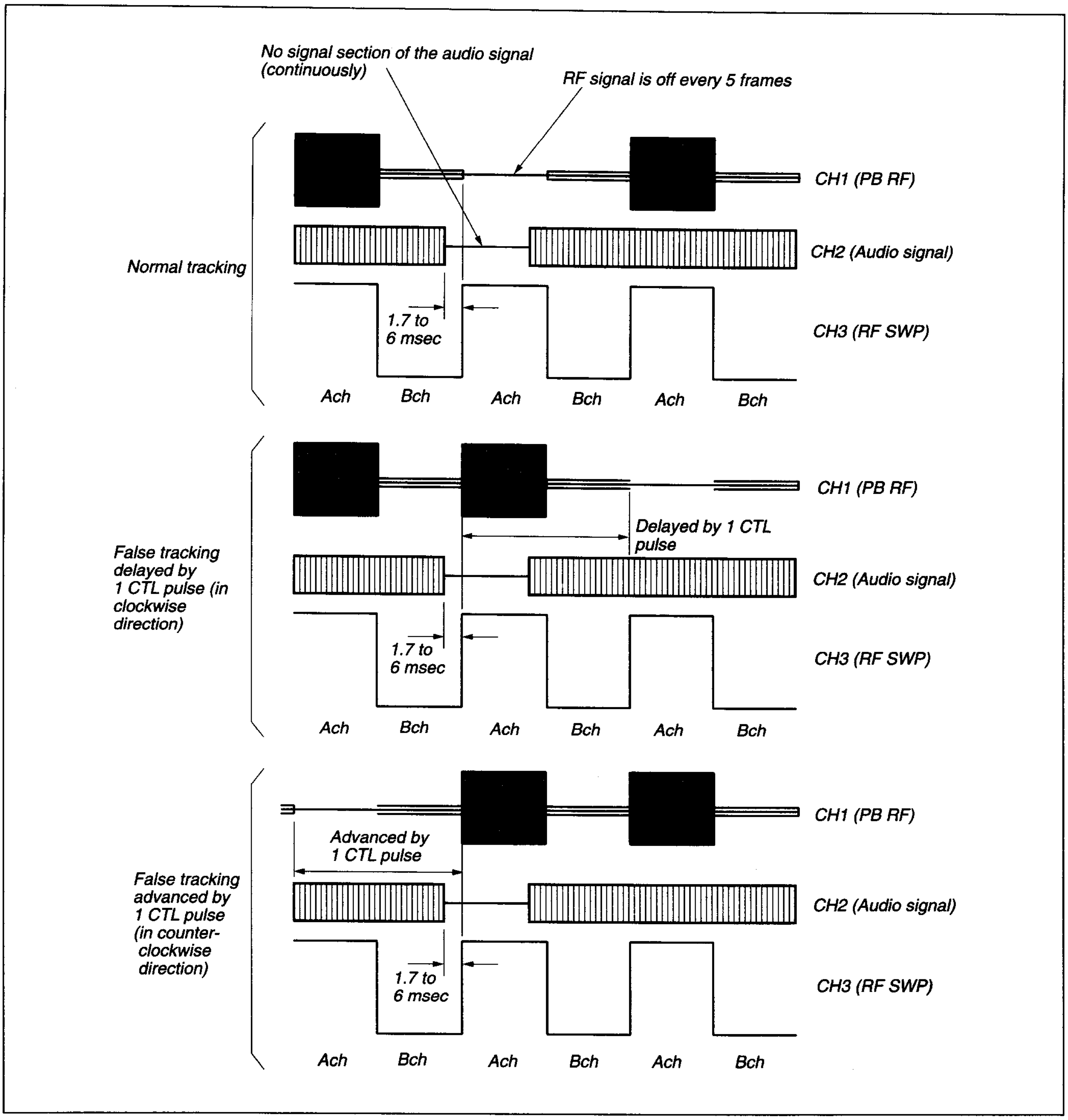

No signal section of the audio signal (continuously)
RF signal is off every 5 frames
Normal tracking
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking delayed by 1 CTL pulse (in clockwise direction)
Delayed by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch
False tracking advanced by 1 CTL pulse (in counter-clockwise direction)
Advanced by 1 CTL pulse
CH1 (PB RF)
CH2 (Audio signal)
CH3 (RF SWP)
1.7 to 6 msec
Ach
Bch
Ach
Bch
Ach
Bch

Table. 4-6

3-22. CAM MOTOR ASSEMBLY, LIMITER SELECTION ARM

1) Remove FL complete assembly. (Refer to 3-1.)
2) Remove rubber belt. (Refer to 3-4.)
3) Remove FL slider block assembly. (Refer to 3-12.)
4) Remove worm wheel. (Refer to 3-13.)
5) Remove pulley gear assembly with clutch gear. (Refer to 3-19.)
6) Remove and reel direct assembly. (Refer to 3-20.)
7) Remove cam motor retainer ① in the arrow 🅑 while pushing its claw in the arrow 🅐 direction.
8) Then cam motor assembly ② is out of place.
9) Remove the boss of limiter selection arm ③ from the hole on the mechanical chassis by pushing in the arrow 🅒 direction and push it in the arrow 🅓 direction and remove it in the arrow 🅔 direction.

[Note on Mounting]
- Before attaching cam motor assembly ②, confirm the specified locations are coated with grease SG-646 (Ref. No. J-6).

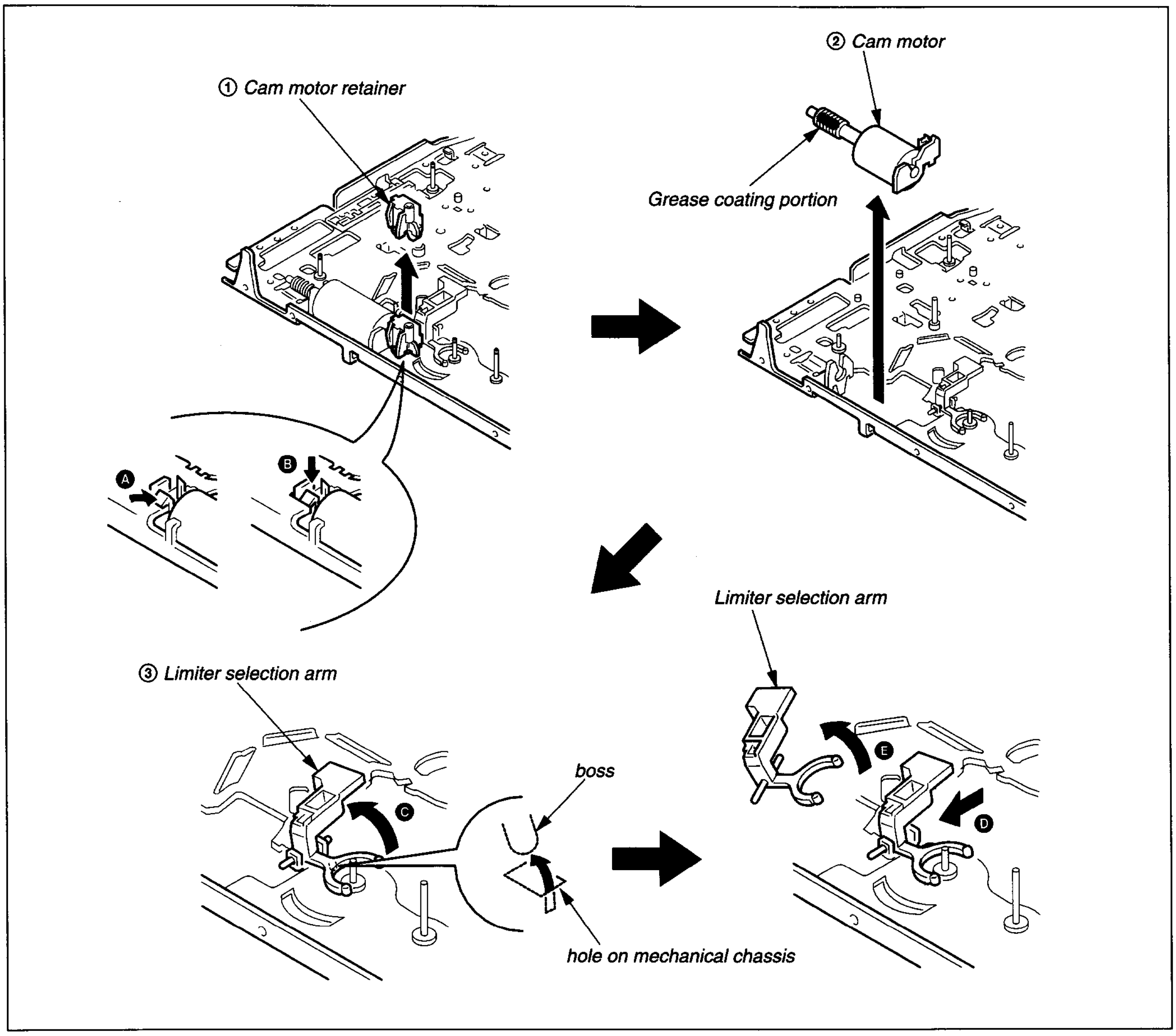

① Cam motor retainer
② Cam motor
Grease coating portion
🅐
🅑
③ Limiter selection arm
🅒
boss
hole on mechanical chassis
Limiter selection arm
🅔
🅓

Fig. 3-27

Reference

• X-VALUE ADJUSTMENT
(Using KRV-52NE having no version No.)

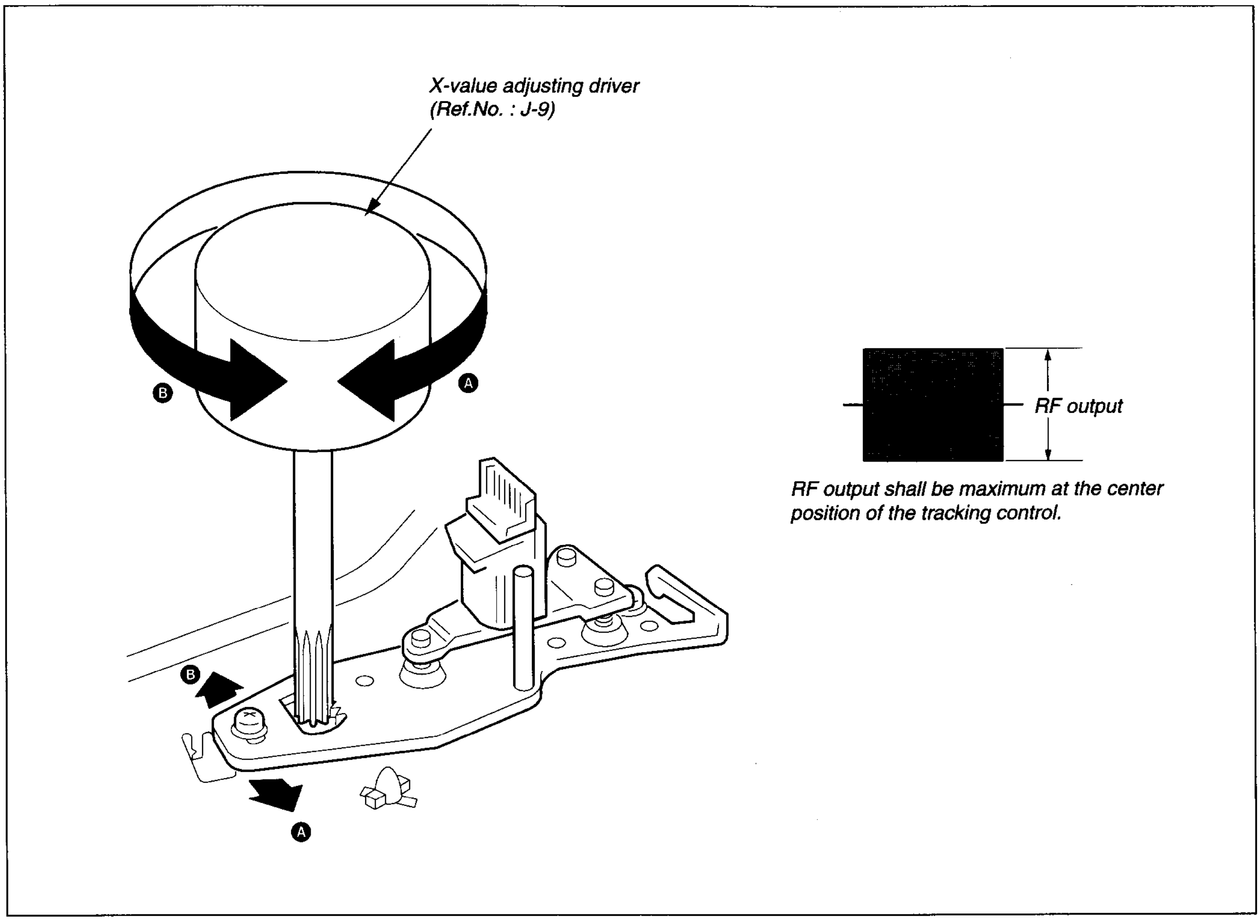
Purpose : To obtain compatibility with other VCRs.

Precaution : Before starting to adjust X-value, set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys. Press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).

Mode	Playback
Signal	Alignment tape: KRV-52NE (For NTSC having no version No.)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2 : Connector RF SWP pin for RF PC board check
Adjustment locations	ACE base assembly

[Adjustment Method]

Set the tracking control at the center position. For the VCRs equipped with standard gap video heads, set the X-value adjustment screw where a maximum RF output is obtained. For the VCRs equipped with wide gap video heads, set the X-value adjustment screw both where a maximum RF output is obtained and where the RF output decreases immediately when the ▼ tracking control key is pressed.



RF output shall be maximum at the center position of the tracking control.

Fig. 4-3

X-VALUE ADJUSTMENT
(Using the tape having no version No.)

* TYPE OF DRUM

DZH-68D	DZH-89A
DZH-71D	DZH-90A
DZH-77A	DZH-91A
DZH-78A	DZH-92A
DZH-78B	

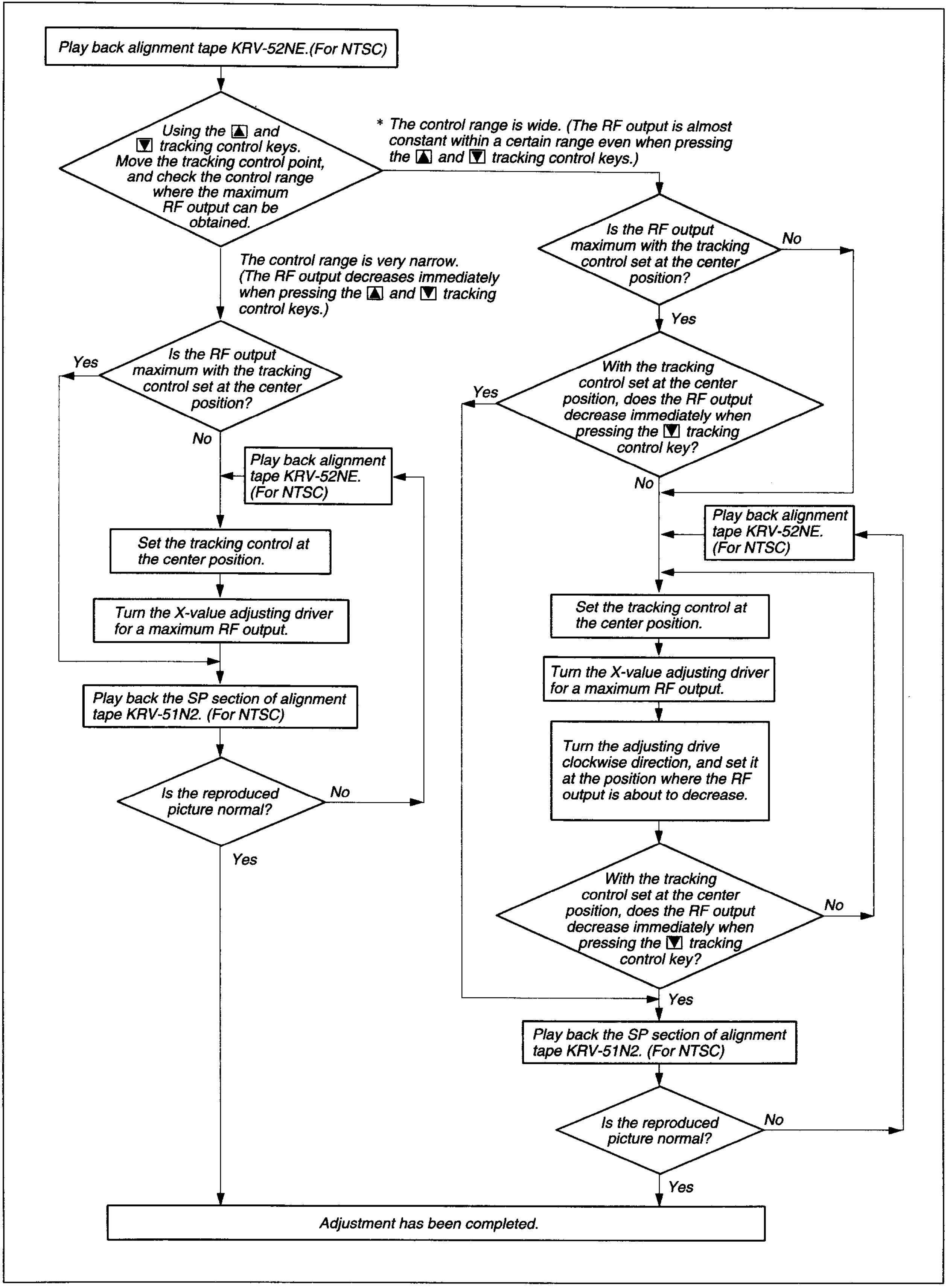

Play back alignment tape KRV-52NE.(For NTSC)
Using the ▲ and ▼ tracking control keys. Move the tracking control point, and check the control range where the maximum RF output can be obtained.
* The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Is the RF output maximum with the tracking control set at the center position?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
Yes
No
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Turn the adjusting drive clockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▼ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

Table. 4-7

[Adjustment Method (*For the VCRs Equipped with Narrow Gap Video Heads)]

Set the tracking control at the center position. Set the ACE head position with X-value adjusting driver both where a maximum RF output is obtained and where the RF output decreases immediately when the ▲ tracking control key is pressed.

* TYPE OF DRUM
DZH-98A

Using the tape having the version No.

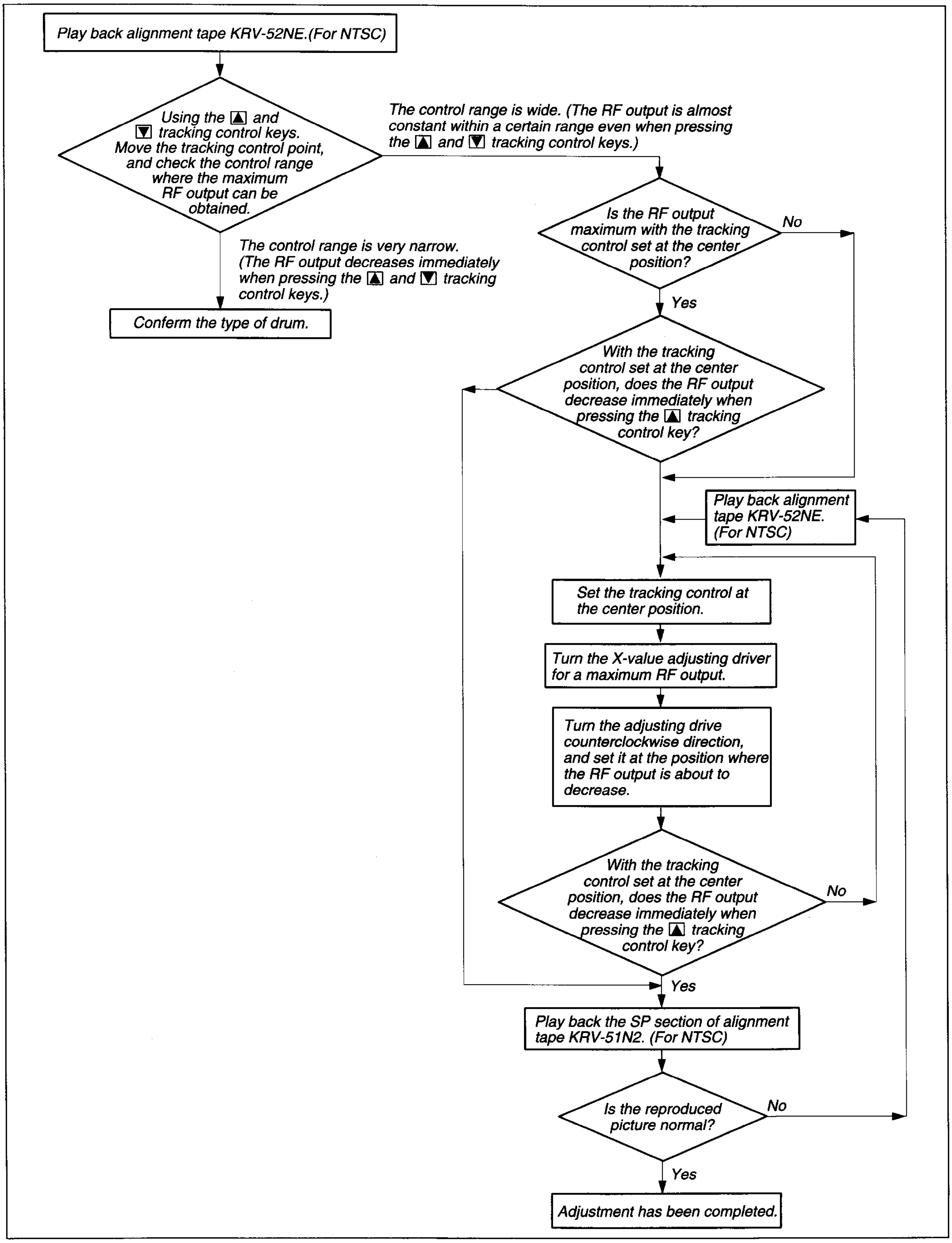

Play back alignment tape KRV-52NE.(For NTSC)
Using the ▲ and ▼ tracking control keys. Move the tracking control point, and check the control range where the maximum RF output can be obtained.
The control range is wide. (The RF output is almost constant within a certain range even when pressing the ▲ and ▼ tracking control keys.)
The control range is very narrow. (The RF output decreases immediately when pressing the ▲ and ▼ tracking control keys.)
Conferm the type of drum.
Is the RF output maximum with the tracking control set at the center position?
No
Yes
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
Play back alignment tape KRV-52NE. (For NTSC)
Set the tracking control at the center position.
Turn the X-value adjusting driver for a maximum RF output.
Turn the adjusting drive counterclockwise direction, and set it at the position where the RF output is about to decrease.
With the tracking control set at the center position, does the RF output decrease immediately when pressing the ▲ tracking control key?
No
Yes
Play back the SP section of alignment tape KRV-51N2. (For NTSC)
Is the reproduced picture normal?
No
Yes
Adjustment has been completed.

Table. 4-9

4-1-4. HEIGHT ADJUSTMENT OF GUIDE ROLLERS NO. 3 AND NO. 6

Mode	Playback
Signal	Alignment tape: KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope TIME/DIV: 2ms Trigger source: CH2 Trigger slope: +
Measuring point	CH1: Connector PB RF pin for RF PC board check CH2: Connector RF SWP pin for RF PC board check
Adjustment locations	Height adjustment screw for No. 3 tape guide roller Height adjustment screw for No. 6 tape guide roller

[Adjustment Method]

The following adjustment shall be carried out after completed Section 4-1-2. X-VALUE ADJUSTMENT.

1) Deactivate the automatic tracking control, and set the tracking control at the center position. To set the tracking control at the center position for the VCRs equipped with the ▲ and ▼ tracking control keys, press both the ▲ and ▼ tracking control keys at the same time. For the VCRs not equipped with the tracking control keys, deactivate the automatic tracking control by pressing the tracking AUTO/MANUAL key on the remote control unit during threading operation (after a tape is inserted but before the VCR starts playing back the tape).
2) Check if the RF output changes in amplitude by pressing the tracking control key. The RF output should change periodically (changes from a minimum amplitude to a maximum amplitude, and to the minimum amplitude again).

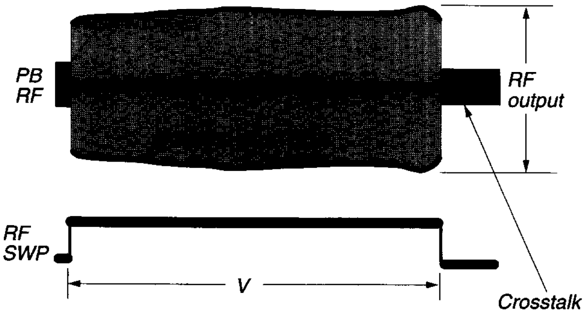
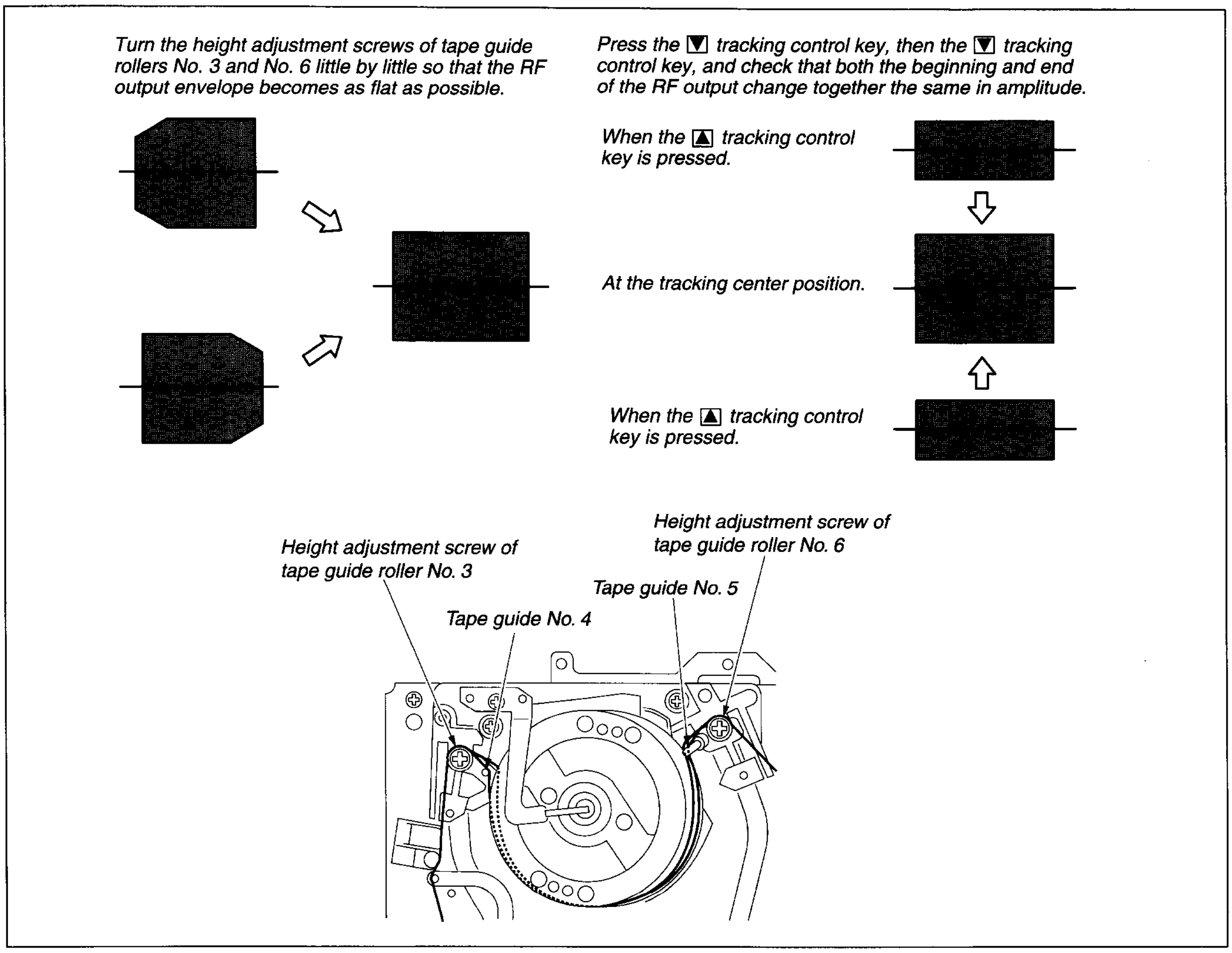

PB RF
RF output
RF SWP
V
Crosstalk

Fig. 4-4

3) Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 so that the RF output envelope becomes as flat as possible.
4) Press the ▲ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.
5) Press the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.



Turn the height adjustment screws of tape guide rollers No. 3 and No. 6 little by little so that the RF output envelope becomes as flat as possible.

Press the ▼ tracking control key, then the ▼ tracking control key, and check that both the beginning and end of the RF output change together the same in amplitude.

When the ▲ tracking control key is pressed.
At the tracking center position.
When the ▲ tracking control key is pressed.
Height adjustment screw of tape guide roller No. 6
Height adjustment screw of tape guide roller No. 3
Tape guide No. 5
Tape guide No. 4

Fig. 4-5

4-1-5. ACE HEAD ASSEMBLY HEIGHT AND AZIMUTH ADJUSTMENT

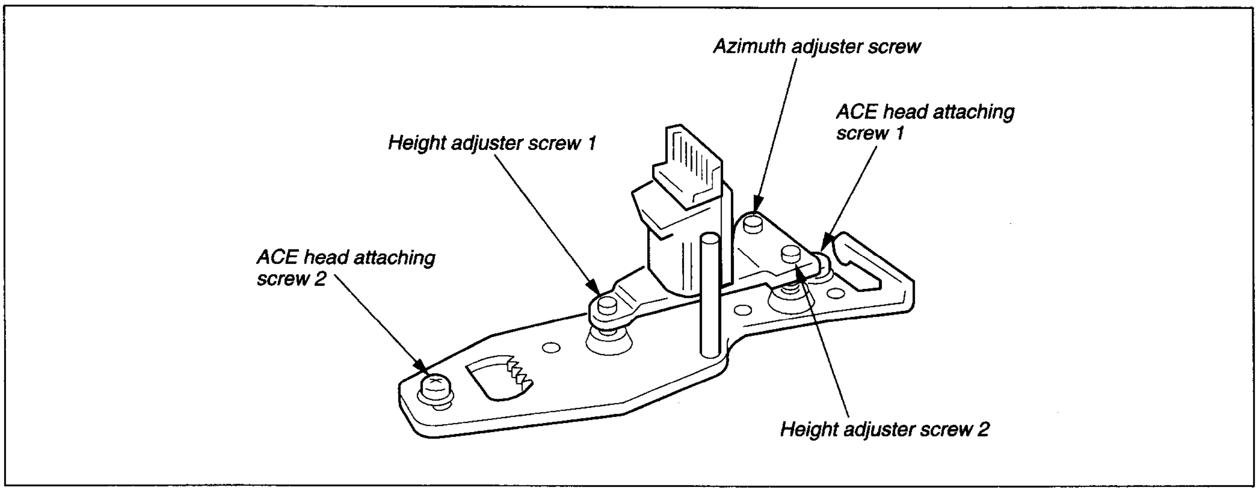

Azimuth adjuster screw
ACE head attaching screw 1
Height adjuster screw 1
ACE head attaching screw 2
Height adjuster screw 2

Fig. 4-6

Mode	Playback
Signal	Alignment tape: (5kHz) KRV-52NE (NTSC)/52PL (PAL)
Measuring instrument	Oscilloscope
Measuring point	Audio output terminal
Adjustment locations	Azimuth adjuster screw, Height adjuster screws 1 and 2.

[Adjustment Method]

1) Adjust the height as shown in the figure with turning the height adjuster screws 1 and 2, and the azimuth adjuster screw in the same direction, the same degree gradually.

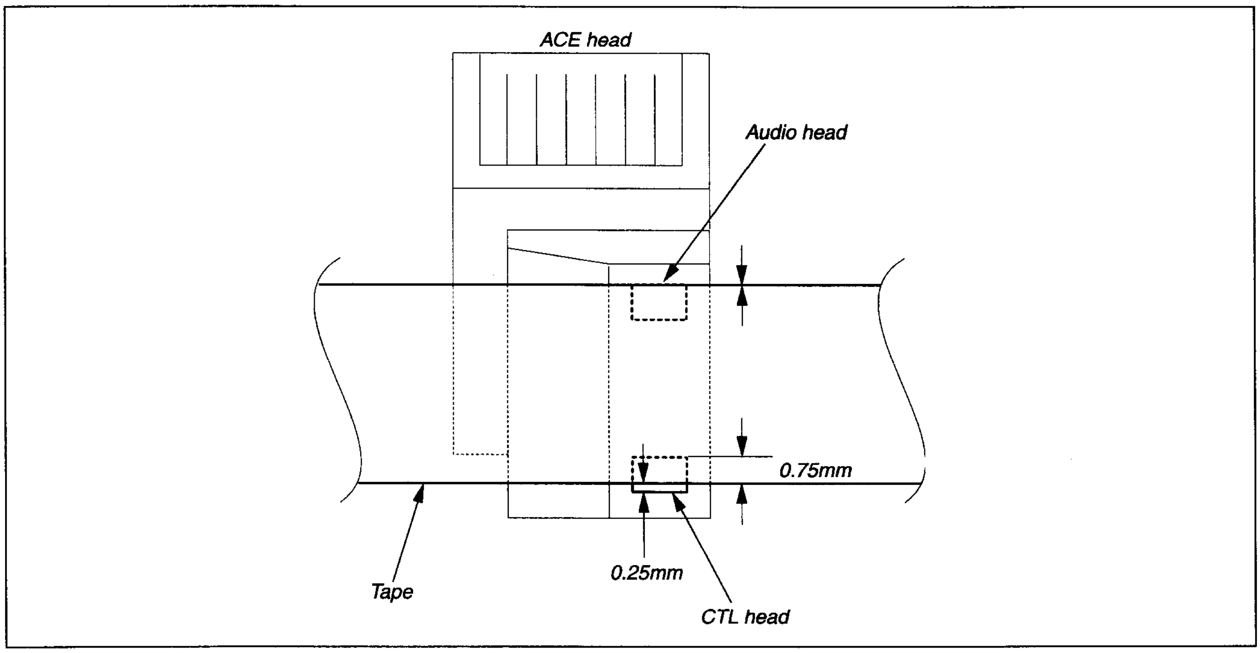

ACE head
Audio head
0.75mm
0.25mm
Tape
CTL head

Fig. 4-7

2) Alternately adjust the azimuth adjuster screw to make A maximum and B minimum. (To maintain even audio output at maximum with minimum deviation.)
3) Perform section 4-1-2. X-VALUE ADJUSTMENT.
4) Tighten ACE head attaching screw 2. (Torque: More than 0.29 N•m (3.0 kg•cm)).

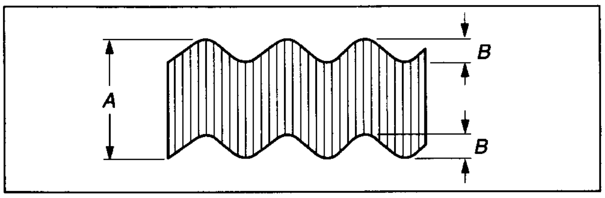


Fig. 4-8

4-1-6. X-VALUE FINE ADJUSTMENT

The procedure is the same as the item 4-1-3. Please refer to pages 37 to 46.

4-1-7. HEIGHT ADJUSTMENT OF GUIDE ROLLER NO. 8

Note : Applicable to the set having TG8 height adjusting screw as shown in the figure. Do not adjust when TG8 height adjusting screw is not attached.

Mode	Playback
Signal	Any signal on thin tape (T-160 or the like) near the tape top.
Adjustment location	TG8 height adjusting screw

[Adjustment Method]

1) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 10 seconds CUE running.
2) When there is curls or wrinkles, adjust with TG8 height adjusting screw.
3) Confirm there is no wrinkles of tape between TG8 and capstan and no tape curl at the upper or the lower flanges of TG8 during 8 seconds REV running.
4) When there is curls or wrinkles, adjust with TG8 height adjusting screw.

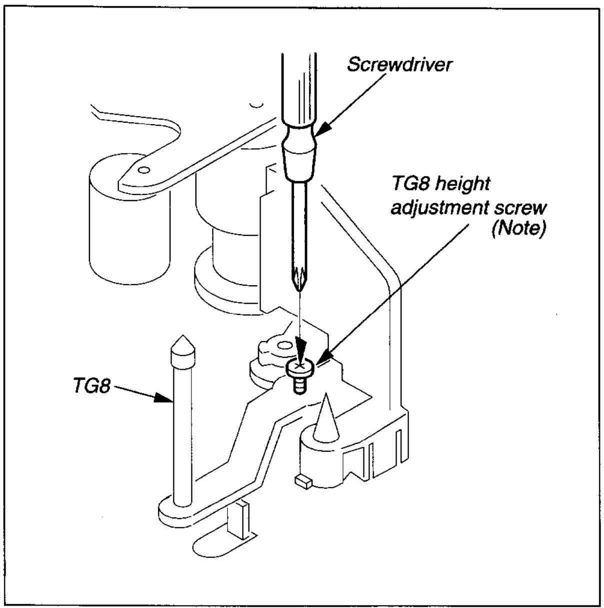


Fig. 4-9

4-1-8. CHECKING THE LINEARITY AND FLUCTUATION OF THE RF OUTPUT

1) Set the RF output to the maximum level using the tracking buttons.

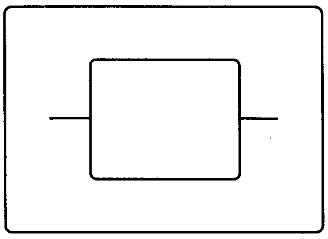


Fig. 4-10-1

2) Perform fine adjustment of the voltage level range of the oscilloscope, adjust the RF output deviation to within 6 gradations.

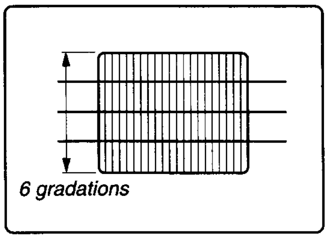


Fig. 4-10-2

3) Press the tracking buttons and adjust the maximum amplitude of the RF output to within 4 gradations.
4) At this time, check if the minimum amplitude is more than 2 gradations.

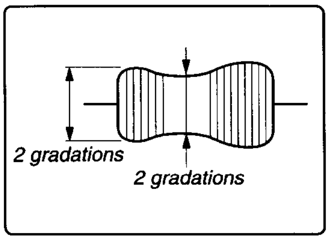


Fig. 4-10-3

5) Check that RF output fluctuation between minimum and maximum levels is within 13%.

5. EXPLODED VIEWS

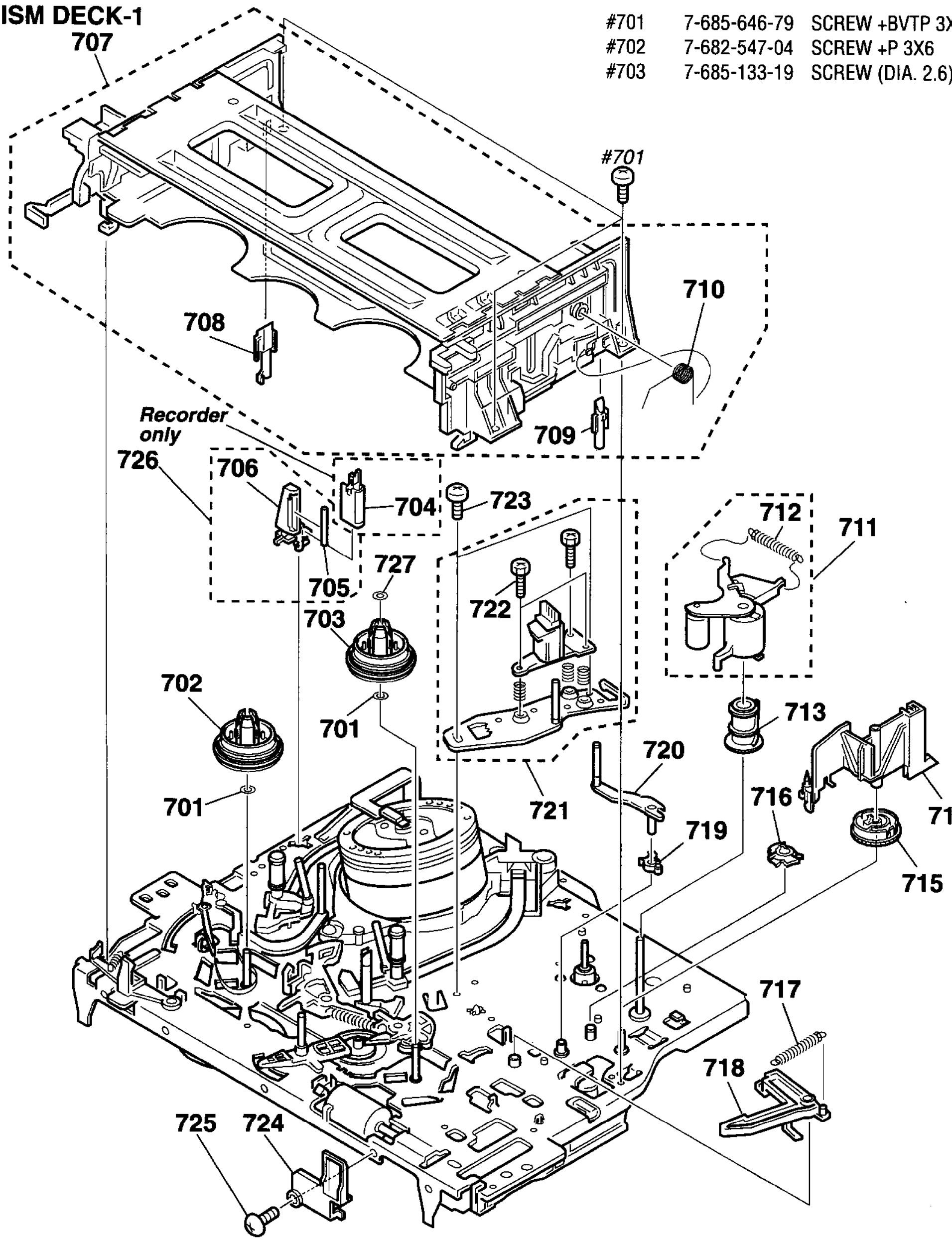
Note:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

****
HARDWARE LIST
****

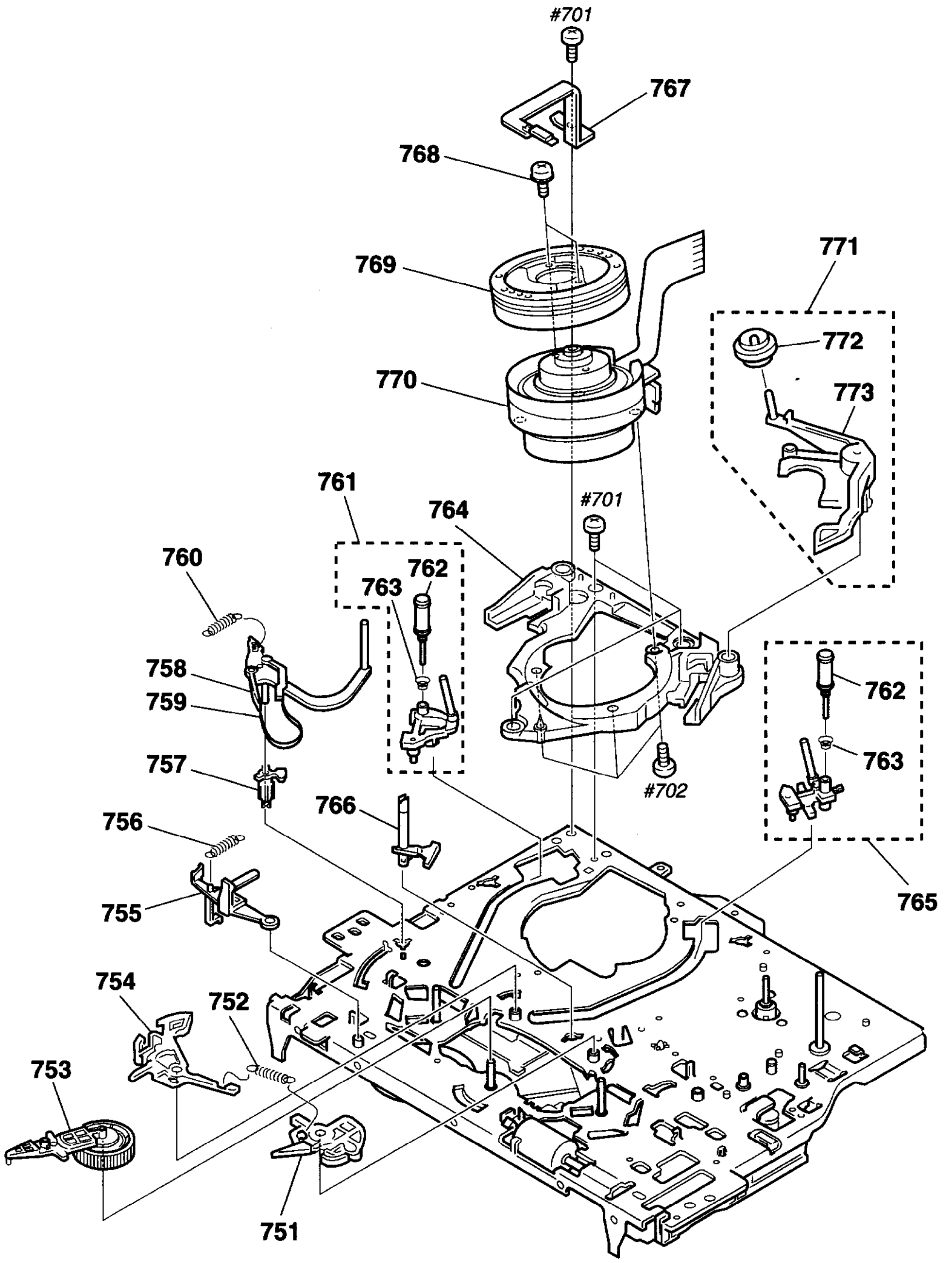
#701	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#702	7-682-547-04	SCREW +P 3X6
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)

5-1. MECHANISM DECK-1



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST		715	3-977-441-01	GEAR, PINCH PRESSING	
702	3-977-507-01	TABLE, REEL (S) (GRAY)		716	3-977-445-01	GEAR, TG8 ARM DRIVING	
703	3-977-508-01	TABLE, REEL (T) (BLACK)		717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
704	1-500-144-11	HEAD, FE (RECORDER)		718	X-3947-582-1	ARM ASSY, RVS BRAKE	
705	3-977-495-01	SHAFT TG2 (RECORDER)		719	3-977-446-01	GEAR, TG8 ARM	
706	3-977-494-01	HOLDER, FEH (RECORDER)		720	X-3947-590-1	TG8 ASSY	
707	A-6759-619-A	FL COMPLETE ASSY BOARD, COMPLETE		721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)		722	3-974-556-01	+ HEXA TT 2.6X9 (TAPER)	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)		723	3-979-508-01	SCREW	
710	3-970-471-01	SPRING (DECK OPEN), TORSION		724	3-978-485-01	PLATE, GUIDE CASSETTE	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH		725	3-696-519-01	+P IT3 SCREW 3X8	
712	3-958-455-01	SPRING (PINCH), TENSION		726	X-3947-817-1	FEH, ASSY (PLAYER)	
713	3-977-447-01	GEAR, ELEVATOR		727	3-977-443-01	WASHER, STOPPER	
714	3-977-514-01	OPENER, LID					

5-2. MECHANISM DECK-2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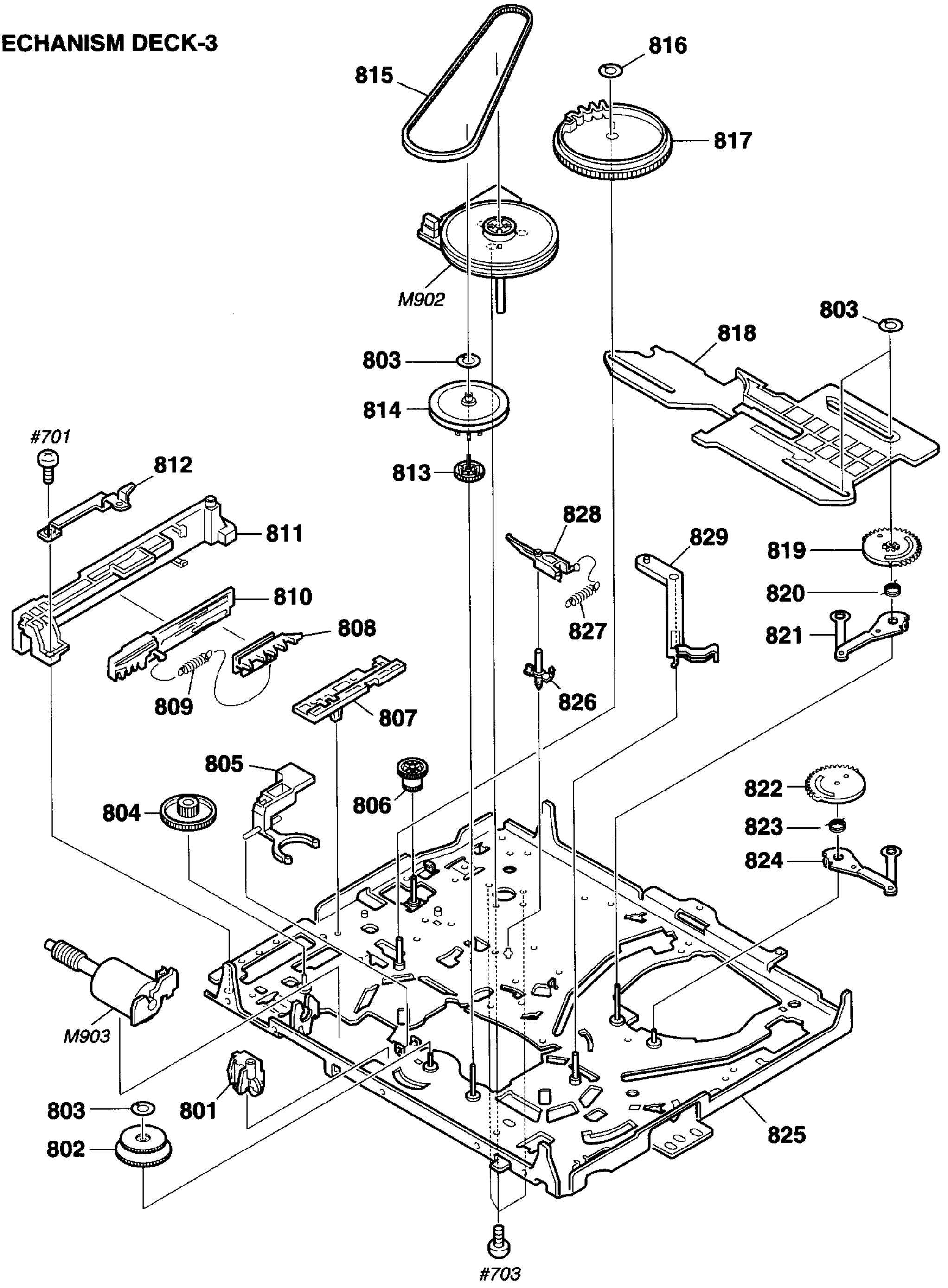
Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARM ASSY, PENDULUM	
754	X-3947-580-1	BRAKE ASSY, MAIN(S)	
755	3-977-513-01	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1 ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-629-01	BASE, DRUM	
765	A-6750-325-A	SHUTTLE (T) BLOCK ASSY	
766	3-977-501-01	PLATE, LUMINOUS	
767	X-3943-899-8	GROUND ASSY, SHAFT	
768	2-643-205-01	SCREW	
769	Refer to the service manual for each model.		
770	Refer to the service manual for each model.		
771	A-6759-614-A	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-977-537-01	ARM, HC ROLLER	

5-3. MECHANISM DECK-3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Ref. No.	Part No.	Description	Remarks
* 801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-01	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-01	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-1	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-01	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
M902	1-698-971-11	MOTOR, DC	
M903	X-3947-577-1	MOTOR ASSY, CAM	

VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ

9-921-647-13
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Home A&V Products Company

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